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New Method of Making Cast Pipe

Hand Labor Eliminated in McWane Mechanical Process—Unique Multiple-Lip Ladle Pours Metal—Conveyors and Cranes Handle Materials—Plant Scheduled Like a Rolling Mill

A SIGNIFICANT departure in pipe foundry practice is back of the recent announcement of the McWane Cast Iron Pipe Co. that the new mechanically operated unit of its Birmingham, Ala., foundries, which went into production on Jan. 1, 1928, was placed on a double shift basis March 1.

Essentially, the new process of making cast iron pipe at the McWane plant involves the substitution of mechanical equipment for hand labor. The same operations that were formerly used are still employed, but machines and mechanical devices, it is said, effect a far greater economy and rapidity of output than was ever possible with the old manual methods.

This new process embodies features of continuous operation and flexibility of output that have heretofore been unknown in the manufacture of cast iron pipe. It still retains, however, the former McWane features of casting pipe 4 in. and larger in 16-ft. lengths, horizontally, in green sand molds with green sand cores. This former method was based on a pat-

Fig. 1—After the Pipe Mold Is Placed on a Special Jolt Ramming Machine, It Is Filled with Green Sand. Notice the belt conveyor supplying sand to the service bins

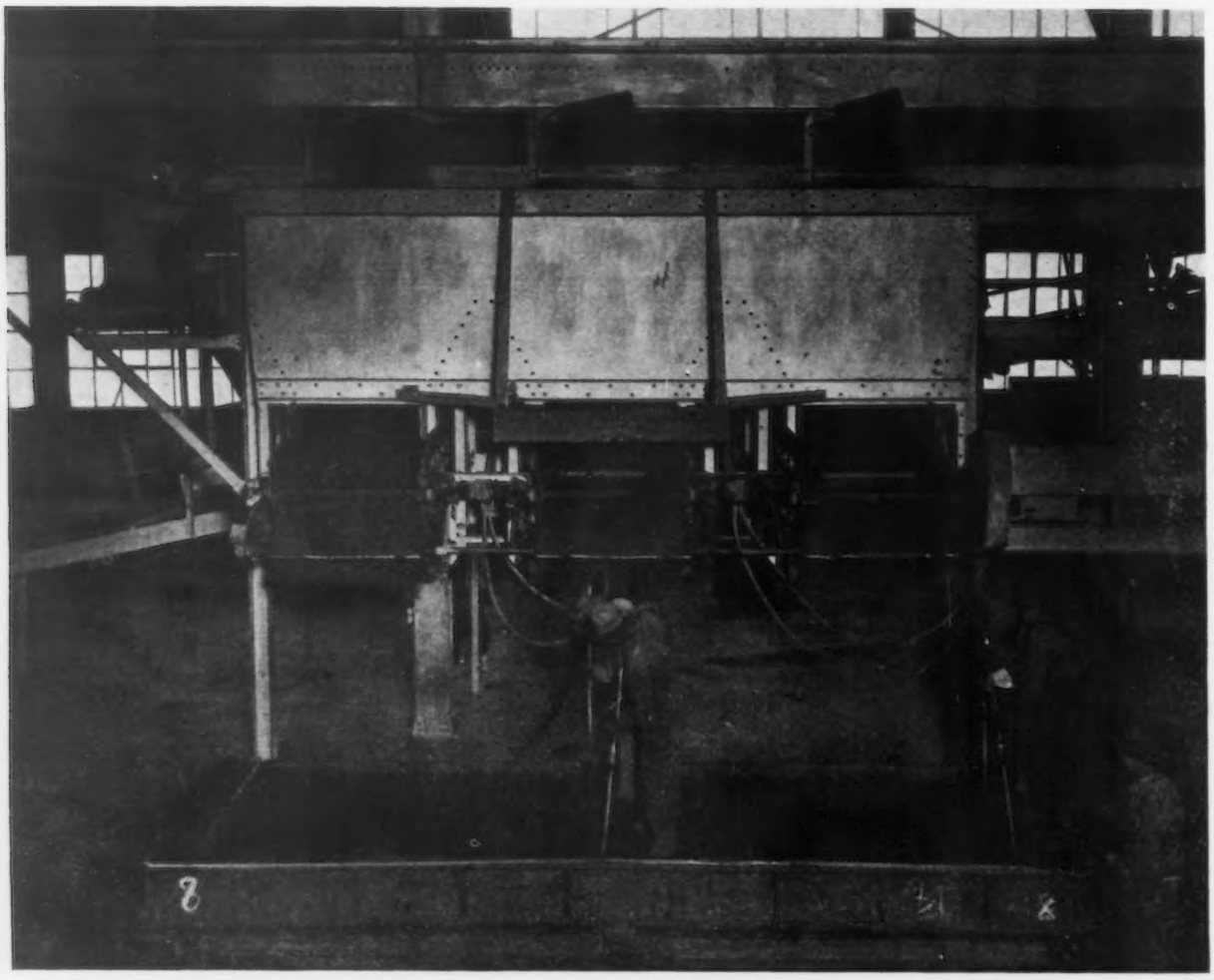


Fig. 2—When the Jolt Ramming Machine Has Finished Its Work, Ramming of the Mold Is Completed with Pneumatic Rammers. This shows four workmen at the mold, which, in this instance, held four 16-ft. lengths of 8-in. pipe

Fig. 3—Here Is Shown a Core Machine Making the Last Core of a Set of Four. When it is completed, the quartet will be picked up by an overhead crane and immediately set in a waiting flask

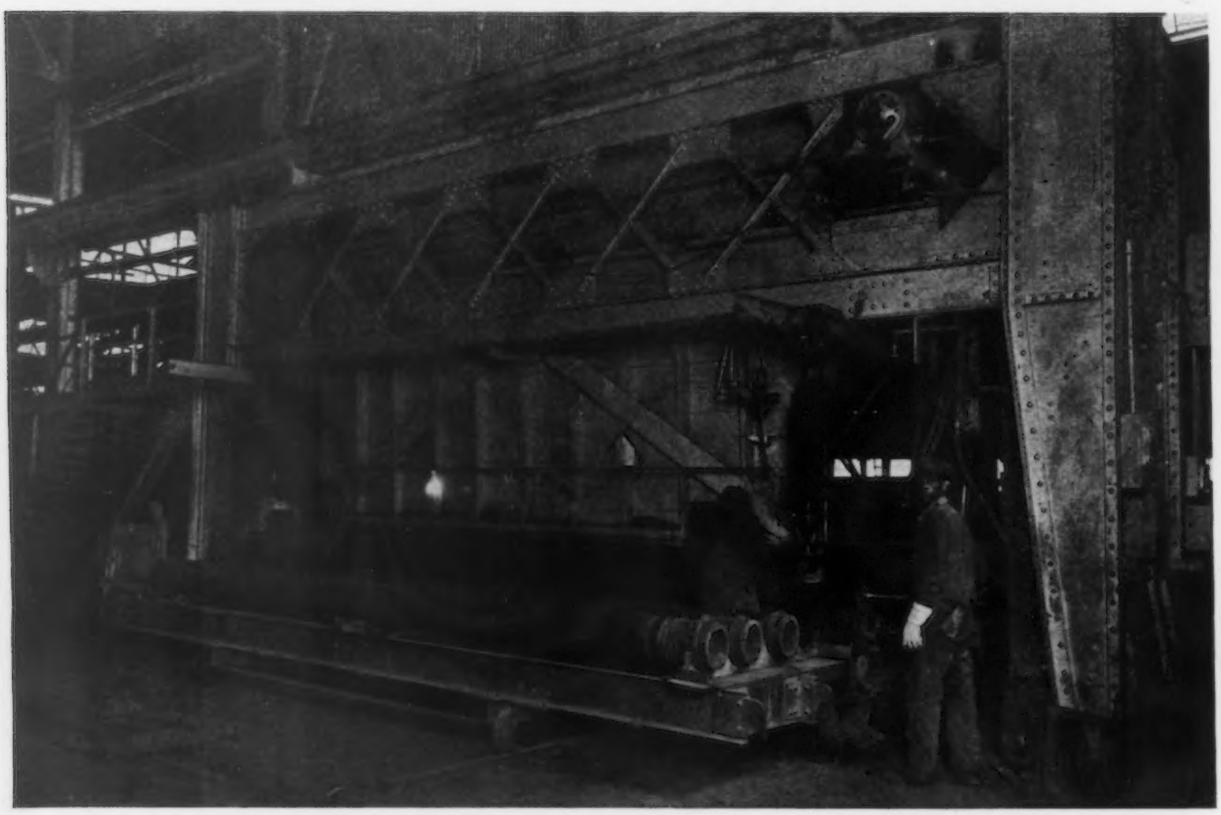


Fig. 4—The Method of Setting Cores Is Graphically Shown on the Left of This Photograph. Notice the two gages. These indicate to a nicety how the cores shall be adjusted in the flask to prevent sagging or floating before and as the molten iron enters the mold. On the right, a completed mold as it looks when ready to be transferred to the casting zone. In both instances a very good idea can be gained of the numerous gates which make it possible to pour two pipes in a few seconds, with the molten iron traveling a minimum distance from the ladle to its final resting place in the mold

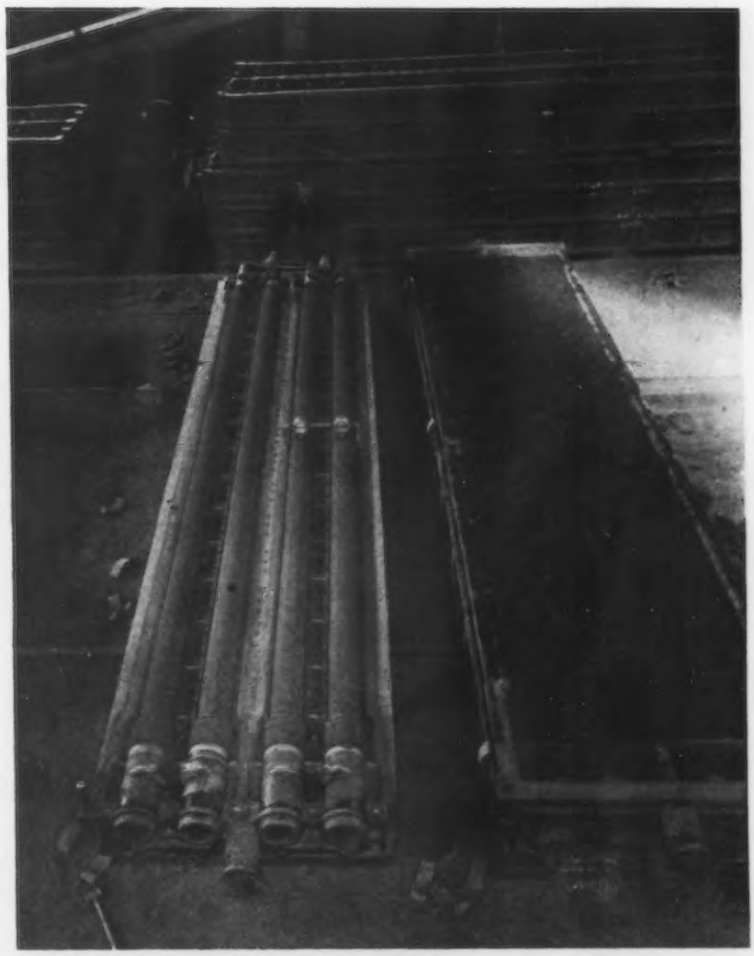
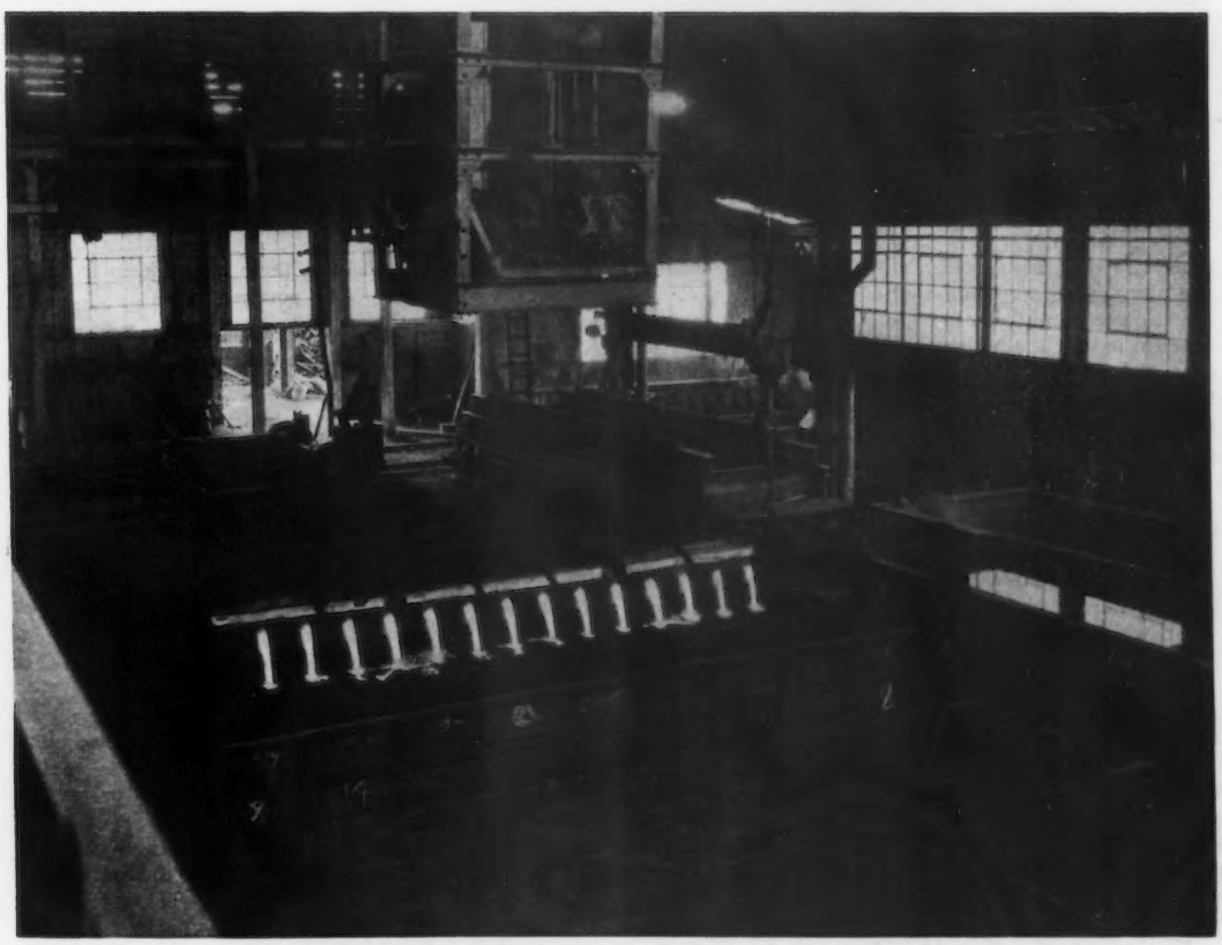


Fig. 5 (Below)—This Gives an Excellent View of One of the Large Multiple-Lip Ladles, Which Pours from 14 Spouts at Once. Two pipes are cast at the same time by this process. In the background, to the right, can be seen one of the shake-out machines



ented device for holding long cores central in a mold without chaplets.

Schedule Production Like a Rolling Mill

The layout of the new foundry unit is interesting mainly in that it permits continuous operation of all factors used in this mechanical process of making pipe. Instead of a certain number of molds being prepared and the molten iron subsequently poured into them, ramming, core-making and core-setting, pouring, shaking out, core bar pulling—and the return of the flasks, sand and core bars for immediate re-use—are simultaneous operations.

Perhaps the most outstanding feature of this new process is that, instead of a certain division of classes and sizes of pipe making equipment arbitrarily fixing the relative output of each day's work, the entire mechanical unit of the McWane plant runs on a given size, as in the case of a rolling mill. Thus orders—and not the proportion of plant equipment for given sizes of pipe—determine the scheduling of production.

Sand Handling All Done by Conveyors

Molding sand used in the McWane mechanical process is handled entirely by conveyor equipment. After the sand leaves the shake-out machines, it is carried to reconditioning equipment consisting of screen, pug mill, blender, storage bins and conditioner. Then a belt conveyor, which runs underground to the foundry, returns it to service bins above and behind jolt rammers.

When a mold is placed at a rammer, the sand is discharged directly into it. This is shown in Fig. 1. Then comes the jolt ramming operation, which is finished off with manual pneumatic rammers as shown in Fig. 2. Any surplus sand that may have been discharged on to the rammer from the service bin is shoveled on to floor gratings immediately in front of the rammer. From there it falls to a clean-up conveying system beneath the floor of the foundry and is, in this manner, restored to service.

The output of each mold is from one to six 16-ft. lengths of pipe, depending upon the pipe diameter. All the equipment in this unit of the McWane plant is designed to make pipe from 4 to 12 in. in diameter.

Molds and Cores Handled by Cranes

Overhead cranes play an important part in the McWane process. One of them handles the copes and drags to the assembling zone, where from one to six cores are set simultaneously. These cores are made by a special 16-ft. core machine, shown in Fig. 3.

Another such crane picks up the cores from the device upon which they have been placed by the core-making machine and sets them in the drags. This second crane, after the flasks are closed, carries them in completed form to the casting and shake-out zone.

Fig. 6—Here Is Shown One of the Large Rattlers Which Is Included in the Finishing Process of the McWane Plant. This machine is capable of handling approximately 19 6-in. diameter lengths of 16-ft. pipe

Throughout the process, these cranes keep from one to six molds ahead of the pouring ladles.

Metal Poured by Multiple-Lip Ladles

Multiple-lip ladles, as shown in Fig. 5, are employed entirely. Each of these large ladles is equipped with 14 spouts and is capable of pouring two 6-in. or two 8-in. pipes at the same time. As previously stated, the number of lengths of pipe to a mold varies with the size being cast.

A third overhead crane handles the ladles and, when this job is completed, places the molds on a car which immediately carries them to a runway leading to the core bar pulling machine. Another duty of the third crane is to place the copes and drags on the shake-out machines. One of these machines can be seen in the background of Fig. 5.

Following the shake-out operation, the endless conveyor system recaptures the sand used in the molding and a smaller wall crane runs the flasks back to storage near the jolt rammers. Then the entire process is repeated.

After they have been removed from the molds, the lengths of pipe, with the core bars in them, are conveyed to the core bar pulling machine. This interesting device extracts the core bars in a few seconds, and the pipe is then rolled to the tumbling mills. Here it is rattled with small steel stars. One of the large rat-

tlers, which is capable of handling 19 lengths of 16-ft. pipe, is shown in Fig. 6.

After leaving the rattlers, the pipe passes through the regular foundry routine of chipping, inspection, hydrostatic testing and, finally, coating—when required.

Thenceforth the pipe lengths pass either directly to the shipping yard or, if they are of special McWane types that are to be equipped with joints, they are diverted to the joint-making department for insertion of the pre-calked lead-and-jute joints. If for high-pressure gas or air service, the pipe is threaded, male and female, at the spigot and the bell ends respectively.

It should be borne in mind that the McWane pipe specifications are of the modern weights and thickness, which factors have been determined by subjecting the product, thus cast in green sand with green sand cores, to tensile and transverse tests and to tests to destruction.

In this manner the weights and dimensions in the various classes of pipe made by the new McWane process are fixed to guarantee the service requirements of older specifications, for both water and gas.

Canteens Placed at Handy Locations in Large Plant

Budd Body Factory Serves Five Million Orders Yearly at Five Cents Each—Everything From a Cup of Coffee to a Full Meal

BY R. W. BAREMORE

AN efficient yet highly specialized lunch system is functioning successfully at the Edward G. Budd Mfg. Co.'s automobile body plant in Philadelphia. Last year it supplied employees with over 5,000,000 food orders. Each one sold at 5c., the standard charge for everything served.

The method of dispensing food is perhaps best described as a canteen system. Distributed throughout the various plant buildings, in convenient locations, are 25 service stations or canteens, all of which are supplied from a central kitchen. As shown in the illustration, each is a wire cage, similar to the modern tool crib, about 6x12 ft. in area, equipped with shelves, counter, cash register and gas stoves. The latter are used only to keep foods hot. At these canteens 7000 persons may be served with one or more food orders in a very short space of time, easily, satisfactorily and economically.

Canteen Brings Lunch and Supper to the Men

At the noon hour the men line up at their respective stations, give their orders, pay for them and are quickly served. It is all done so rapidly that there is hardly any waiting, and the patrons obtain good, substantial food at a low price. Rapid service means that when the whistle blows the men do not need to make a wild dash for a good place in line; furthermore, they are able to take full advantage of their lunch hour for eating, rest or recreation.

This unit cafeteria plan has now proved its usefulness over several years at the Budd plant, and has been found to provide, among other things, the following distinct advantages:

1. It supplies good food at low prices, thus conserving and even improving the health of the workmen.
2. It uses with economy a limited amount of valuable floor space.
3. It gives quick service to all during one lunch hour, thus insuring proper rest and avoiding the necessity of staggering the working periods to prevent overcrowding a central lunch room.
4. It operates as a service department and as an aid to production, as well as a convenience to the employees.

None of these advantages could be obtained, however, were the system lacking in popularity among the employees. To insure this popularity the needs and desires of the patrons are closely studied, their tastes analyzed and their wants anticipated. With every food order priced at 5c. there is a wide variety from soup to ice-cream. A man can supplement the contents of his lunch box with a single order of hot soup or coffee, or, if he does not carry a "nose-bag," he can get a well balanced meal.

Since the Budd company's canteens sold over 5,000,000 orders last year, it stands to reason that the system must be highly thought of by the employees, else it would not be so well patronized.

A glance at the records of the commissary department shows that the canteens used 60 tons of bread last year, 18 tons of sugar, 60,000 qt. of cream, about 700,000 orders of pie, close to 80,000 gal. of coffee and 40,000 gal. of soup. Sandwiches, of course, lead all food orders, over a million having been sold during 1927.

The above figures apply only to lunches served in the shop. In addition to this, the Budd company maintains a restaurant for office employees, where some 50,000 meals are served annually.

For many years past, business organizations have found that it pays and pays well to provide luncheons for their employees, even when the actual food cost is considerably higher than the prices charged. Whether this end can be served by building a central cafeteria, by subsidizing a restaurant on neighboring ground or by installing a central kitchen and a number of can-

teens, such as described herein, is a matter to be determined by an analysis of the individual circumstances. Where the operations are spread over large floor areas, the canteen will usually be found to appeal to the workmen. It returns dividends in time saved, better health, and therefore better and more efficient production, and is a direct factor in preserving morale and good will.

At least this has been the result at the Budd plant. It has also been found that the curse has been taken from overtime or night work by the willingness to supply an appetizing supper at short notice. As a matter of fact, no service of this kind is refused, irrespective of the cost, if a corresponding benefit accrues to men and production management.

New Drive for Three-High Plate Mills

Driving Center Roll at High Speed Gives Large Torque with Increased Flywheel Stored Energy

BY MAJ. JOHNSTONE TAYLOR

A ROLLING mill slip drive designed and built by Duncan Stewart & Co., Glasgow, Scotland, is stated to possess several advantages. Its arrangement is shown in the accompanying diagram. It has been in existence for some time on two-high reversing plate mills, on both roughing and finishing stands, and is now being applied to three-high mills, where it would appear to have great possibilities.

It will be seen that the customary pinions and pinion housing have been eliminated. Their place is taken by a light nest of gears between the flywheel and the mill spindles. As the usual type of pinions may cost up to $20,000 on a 30-in. mill, the saving in first cost and in renewals is important. The torque is applied to the center roll, which hitherto has not been driven. By this method it is possible to speed up the flywheel about 30 per cent with the same rolling speed, resulting in a great increase of momentary mill power without increasing the size of the mill motor or the weight of the flywheel. In a recent installation an 80-ton flywheel proved of equivalent value to the previous 150-ton unit, due to the greater revolutions for the same rolling speed.

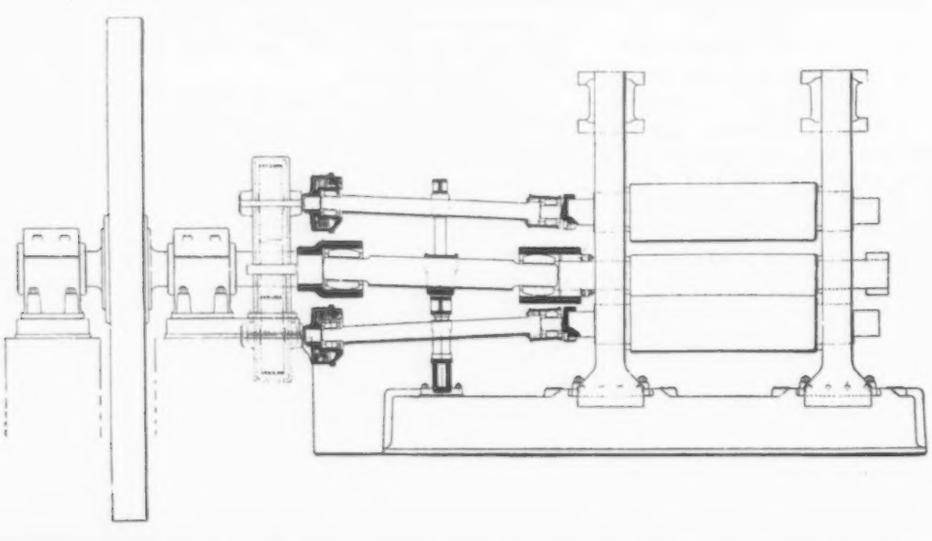
The addition to the plant involves but a new pair of machine-cut double helical gears and a new middle roll having larger necks and chocks. Thus for quite a small outlay an existing mill can be given something like 75 per cent increased mill torque. In addition, the end of the new middle roll can be made suitable for the universal coupling box of the driving spindle, while the top and bottom existing rolls can be made to take the new attachment.

In addition to there being 75 per cent added momentary power, the rolling power consumption is reduced well below the original amount, due to the smaller diameter of the middle roll. If there is to be no increased size of slabs, there may be no need for the increased diameter of roll necks, though the increase of power, as is known, rises more quickly than the increase of roll speed.

Only a mill provided with slip drive can make use of this method for operating a three-high mill. A positive connection between the upper and lower rolls when producing a finished plate is inadmissible. On the finishing stands of a reversing plate mill the upper roll is not driven, with the result that many rolls are broken, due to shock, though little damage is done to the plate; but if both were driven, thin plates would be torn to pieces.

With this new equipment every roll is driven and is under full control. The top and bottom rolls are each driven through a slip drive, which permits them to adapt themselves to the central driven roll speed. The result is a much more powerful machine, its total energy is increased, its speed drop is negligible, while the increased flywheel energy and reduced mill torque insure steady running by reason of the lessened demand from the flywheel.

The Cincinnati chapter of the American Society for Steel Treating held its monthly meeting April 5 at the Cincinnati Milling Machine Co.'s plant. After an inspection of the plant, the members listened to a short talk on "Austenite" by E. P. Stenger of the Queen City Steel Treating Co., and an informal presentation of electric methods of heat treating, normalizing, carburizing, hardening and drawing by H. Stanley Binns of the Cincinnati Milling Machine Co. A film showing methods of electric heating concluded the program.



AS the Torque of the Drive Is Applied to the Center Roll, Heretofore Not Driven, the Flywheel May Be Speeded Up 30 Per Cent, Giving Smoother Operation

Does Price Cutting Help the Buyer?

Destructive Competition Inimical to Interests of Purchaser and Seller Alike, Says Charles F. Abbott in Address to New England Purchasing Agents' Association

"DOES price cutting work out to the buyer's interest?" was the theme of an address delivered before the New England Purchasing Agents' Association at Boston on April 9 by Charles F. Abbott, executive director American Institute of Steel Construction, who has been speaking throughout the country to business organizations on the necessity of curbing price cutting as a means of securing adequate profits for industry.

"In the long run, buyer and seller alike will be adversely affected by any influence which undermines the stability of the other," said Mr. Abbott. "The best assurance for the consistent prosperity and progress of both, and of American business as a whole, lies in active cooperation to foster constructive influences and stamp out those, such as price cutting, which are responsible for destructive competition that menaces the welfare of all concerned.

"Formerly, in periods of active business, practically all organizations except the markedly inefficient could depend upon enjoying a share of the general prosperity. Today this situation does not hold. Considered from most angles, the last few years have been prosperous. Wages have been good, the purchasing power of the public has been at a high level, and the volume of sales has been satisfactory. Why, then, did we average 2000 business failures a month all through 1927? Why do we find adequate profits monopolized by a comparatively small number of organizations while the rank and file struggle along in a welter of red ink figures, passed dividends and complaints about profitless prosperity?

"Much of the responsibility for these situations," Mr. Abbott continued, "can be placed squarely upon the selfish desire to obtain all the business in sight. Business men seem to have lost all sense of proportion in a wild scramble to attain volume at any price. The idea seems to be to keep your competitor from getting any business at all. Greed for volume, without due attention to costs and profits, leads directly to price cutting. Price cutting leads directly to rancorous, cutthroat competition and to obliteration of all semblance of salesmanship.

Price Cutting a Vicious Circle

"In a number of our key industries there is actually severe depression due largely to the practice of slashing prices to meet the terms of competitors who are expert slashers themselves. The whole thing is a vicious circle, and, if the tendency continues at its present rate, it threatens to bring trade prostration of the worst kind.

"The aggregate net income of 385 important railroad, industrial and utility corporations was $2,467,000,000 in 1927 compared with $2,570,000,000 in 1926. The decline amounted to more than 4 per cent. Forty-one of the important industrial concerns reporting showed either a decrease of 50 per cent or more in net income as compared with 1926 or showed a deficit as compared with a net profit in 1926. In six out of the 10 industries listed, lower prices is given as one of the basic causes of the shrinkage.

"The predicament in which the seller finds himself as a result of inadequate prices is an exceedingly uncomfortable one, but is there any reason why the buyer should be particularly worried about the price-cutting activities of the organizations from which he buys? If these organizations want to commit suicide by supplying him with materials at less than cost, is there any reason why he should be concerned? Is there any reason why he should not take the fullest possible advantage of a buyer's market while such a market exists?

"The old-fashioned purchasing agent would have answered 'no' to both of these questions without the slightest hesitation. Practically his sole concern was with price. His tactics were limited to a question and a protest. The first question he put to the salesman invariably was 'What's your price?' The form of the protest was equally invariable: 'Too much. Go home and sharpen your pencil. Then come back and maybe we can talk business.'

"The Bell Telephone System was one of the first large organizations in the country to lift some of the emphasis from price and place it on those other factors where it belonged. Price remained important, but even more consideration was given to the twin elements of quality and service.

"The advantages of the shift quickly became so apparent that a number of other organizations fell into line. Their purchasing agents were lifted from their former positions as official hagglers, and were turned into purchasing engineers whose duties include the study of fundamental factors that control price movements and underlie the production of raw and semi-finished materials.

Many Purchases Made Solely on Price Basis

"Marked progress has been made in the right direction, but there is still plenty of room for more. Although a growing number of concerns are replacing the haggler with the purchasing engineer, there are innumerable organizations throughout the country where the haggler still reigns supreme and where the purchase is made almost solely upon a price basis.

"No one will attempt to condone the actions of the price-cutter. It must be admitted, however, that the buyer is frequently guilty of what might be called purchaser profiteering, in contrast to the seller profiteering that we experience when demand is abnormally high and supplies are short.

"Purchaser profiteering usually takes the form of jockeying one seller against another to force down the price. Each seller, in turn, is told that the buyer would like to give him the business, but that another bidder's price is lower. The bids are progressively forced down until the man who receives the contract obtains it only at a losing figure. As the practice continues over a period of months or years, all transactions are completed at losing prices and the industry involved is headed for the rocks.

"As you know, the National Association of Purchasing Agents has strongly condemned the subterfuge of pitting one seller against another. The seller is, of course, to blame for being too weak-kneed to look the order in the face and say 'no,' when he is fully aware that it will almost certainly entail a loss. Neverthe-

less, it is to the interest of the buyer to cooperate with him in eliminating this and other forms of the price cutting evil which at the present time is proving a heavy handicap to the prosperity of industry.

"In the first place, quality and service inevitably suffer when the price is cut below the line of a reasonable profit. The seller is almost irresistibly tempted to resort to substitute materials or inferior workmanship. Deliveries lag. The seller tries in every possible way to repair the mistake he made when he submitted a price based, not on a fair profit upon the transaction, but upon the vicious system of trying to beat out competition.

"The buyer does not receive what he ordered. He receives exactly what he pays for—no more and no less. In the end he pays a price much greater than one based upon cost plus a fair profit, while the seller makes another red entry that brings him nearer bankruptcy.

"Sometimes, it is true, the buyer escapes the penalty. Then it is the ultimate consumer who pays. But business of this kind is built on a foundation of sand. It can never be permanent. Quality, reputation, good will, and all the other business building assets must be thrown overboard for the sake of a quick sale on a price basis.

"The maintenance of his source of supply is another factor that makes a fair profit for the seller about as important for the buyer as for the seller himself. The wise buyer realizes that unless those who supply him with essential materials are able to make a reasonable profit they will either be forced out of business altogether, or will turn to the production of other materials in the manufacture of which they can employ their capital and brains to better advantage.

Sheet Steel Industry was Losing $8 a Ton

"About a year ago it was reported that the producers of sheet steel were losing an average of over $8 a ton on every ton of sheets turned out in their plants. Think of it! There is an industry, well established, with heavy investments in plant and machinery, and supplying an essential commodity. Business conditions were generally good throughout the country. The market for sheet steel was expanding. Yet the sheet mills were not only unable to operate at a profit; they were forced to operate at a loss. Price cutting was almost wholly responsible for this condition.

"A large part of the product of the sheet steel manufacturers is used in automobiles. The automobile industry is very nearly dependent upon the sheet steel industry. It is almost impossible to conceive of an automobile without a steel body. If the sheet steel industry were forced out of existence, or if its efficiency were materially reduced, the automobile manufacturers would suffer irreparable injury.

"The automobile manufacturers, however, did not hesitate to take advantage of opportunities to obtain quotations below the cost of production. This attitude, coupled with the weakness of the sheet people, resulted in utter price demoralization that shook the stability of the entire sheet steel industry. Fortunately, the automobile manufacturers appear to have realized the suicidal nature of their policy, and they have announced that they are willing to pay a fair price if they can be assured that the first price quoted will be the last.

"That incident in itself adds tremendous weight to the argument for the one-price policy as opposed to the horse-trading methods involved in price cutting.

Does Buyer Secure a Real Advantage from a Cut Price?

"All that I have said about the admitted disadvantages of price cutting, from both the buyer's and the seller's point of view, might be offset in the eyes of the buyer if, as a result of price cutting, he were able to secure materials at a lower cost than his competitor. There is no question but that the success of a concern is vitally affected by the price at which it is able to obtain raw or semi-finished materials.

"Before it is possible to prove that price cutting is thoroughly inimical to the interests of all concerned, it is necessary to show that the practice cannot give the buyer an advantage over his competitors. Such a demonstration is not difficult. It is even possible to show that in obtaining a price concession which may appear to afford such an advantage, the buyer has in reality handicapped himself in meeting competition.

"Granting that it is sometimes possible to keep a price concession a secret, it is nevertheless true that the salesman who offers one buyer a cut rate will offer his competitor the same cut whenever it is necessary to do so in order to obtain the business. Who profits then? Neither concern will possess any advantage over the other. But, you may say, each concern has a wider margin between its costs and its sales price.

"The trouble is that it seldom works out that way. One of the concerns in the industry is practically certain to use the cut price it has been able to obtain on materials to cut its own price. Other organizations will have to follow suit. Price cutting that started in an intermediate industry is transferred to the buyer's own industry. The final result is lowered prices for all.

"The buyer must recognize the essential nature of the function performed by the seller and the threat to the well-being of both buyer and seller which price cutting, with its constant seepage of profits, inevitably entails. The seller must recognize that if he expects the buyer to pay him a fair profit, he owes it to the buyer to cut his costs to the lowest possible level consistent with good quality and good service."

Monthly Index of Gross Orders for Machine Tools Shows Upward Trend

(Average Monthly Shipments 1922-23-24=100)

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From Data Compiled by National Machine Tool Builders Association

Intricate Spun-Sorbitic Castings

Produced in Great Britain by New Process—Have High Strength, Machinability and Wear Resistance—Useful for Engine Cylinders and Pistons of All Kinds

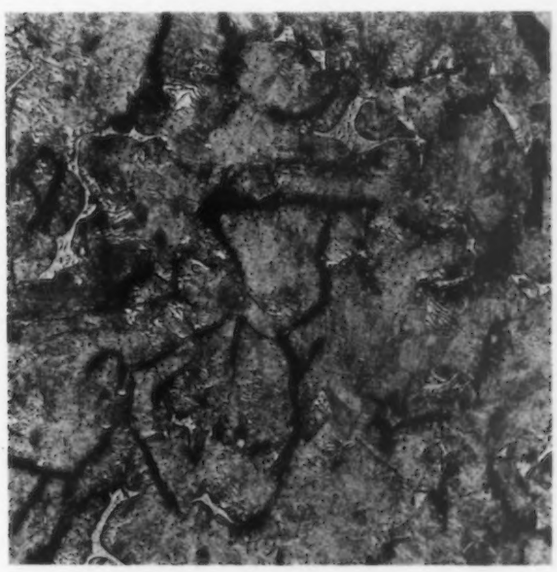
BY J. E. HURST*

DURING the past few years the centrifugal process has been extensively applied to the production of cylindrical castings in cast iron, such as piston ring drums, cylinder barrels for pump and motor engines, and sleeve valves. In Great Britain today approximately all the piston rings used in automobiles are produced from centrifugal castings.

Desirable Structure to Resist Wear

It is generally accepted by internal combustion engine designers that the best material to withstand the wear and heat conditions to which the cylinder liner is subjected has the lowest silicon and total carbon contents compatible with commercial machinability and soundness. In the ordinary centrifugal process the silicon must have fairly high values.

It has been established in connection with the lower-carbon alloys—steels—that the sorbitic condition is one which is highly resistant to wear. It is reasonable to expect that this structure will be accompanied by similar results in cast iron. If the tensile strength can be taken as an index of the resistance to wear of cast iron, it will be seen from the typical results quoted below for sorbitic iron that this conclusion is amply justified.



Structure of Spun-Sorbitic Casting, Magnified 200 Diameters

As is well known to metallurgists, the sorbitic structure is one of the intermediate structures between the hard unmachinable martensite which occurs in quenched iron-carbon alloys, and the pearlite which occurs in these alloys when slowly cooled.

The "spun-sorbitic" process, now in operation at Thorncliffe Ironworks, near Sheffield, England, is a special improvement (for which patents have been applied) in certain details of the Hurst-Ball centrifugal casting process, described in THE IRON AGE, June 11, 1925, page 1704. It is so devised that the cooling of the casting is under close control while rotating in the machine, and the result is that the combined carbon in the alloy is retained in the sorbitic condition. Such control of the cooling rate also enables us to adjust the silicon according to the mass, radial thickness and other chemical elements present, as would be done in sand casting, and permits equally low silicon contents.

A typical chemical composition, taken from a series of spun-sorbitic piston valve liners, is given below:

	Per Cent
Total carbon	3.00
Combined carbon	0.97
Graphite	2.03
Silicon	1.31
Manganese	0.42
Sulphur	0.11
Phosphorus	0.34

Two tensile strength determinations made after the manner laid down in the British Engineering Standards Association Specification No. 5004 are as follows:

28.9 tons per sq. in. (64,800 lb. per sq. in.)
26.4 tons per sq. in. (59,200 lb. per sq. in.)

Half-Ton Diesel Engine Liner, and Locomotive Cylinder Liner as Cast and After Machining

These test results are obtained from test rings machined from the actual castings, it being impossible to cast separate test bars by the centrifugal method. The above tests therefore represent the actual strength of the castings.

The microstructure illustrated demonstrates the sorbitic character of this material. It has been etched in picric acid and photographed at 200 diameters. Small areas of pearlite, with the laminations accurately focused, may be observed, but the bulk of the gray-toned ground mass is entirely too fine in structure to be resolved. It is definitely a sorbitic constituent.

Intricate Castings Made

One feature of the newly developed spun-sorbitic process is that larger and more intricate castings may be made. This extends the centrifugal casting process to the production of the larger cylinders required by

*Newton, Chambers & Co., Ltd., Thorncliffe Ironworks, Sheffield, England.

heavy gas, oil and Diesel engines, piston valve liners for locomotive and steam engines operating on high degrees of superheat, and similar cylindrical castings of more intricate type. Typical examples of spun-sorbitic castings are illustrated. The view shows a cylinder liner weighing about half a ton for an internal combustion engine and a piston valve liner both before and after machining.

These castings are of greater intricacy than the simple cylindrical forms hitherto produced. The heavy flange, with the cored-out waterway passages, the ribs, bosses and belts are clearly shown in the cylinder liner casting and the ports in the piston valve liners have all been produced by cores inserted in the rotating molds. These products have the characteristics of centrifugal castings, as ordinarily understood, being close in grain and free from internal defects, as well as being correct in microstructure and external form.

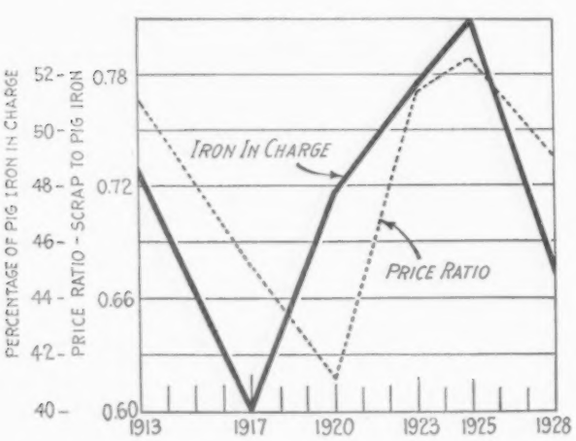
The rapid development in motor transport during recent years has been reflected in the greatly increased annual mileage done by automobile engines. This fact has drawn attention to the wear in the engine cylinders. It is realized that in the generally accepted monobloc cylinder design, the primary consideration in determining the character of the cast iron is the production of sound castings free from defects. The resistance to wear of the material is of secondary nature only. Under these circumstances increasing attention is being paid to the construction of automobile engine cylinders by inserting a previously machined cylinder barrel or liner into a water jacket casing. This is exactly the same method of cylinder construction as is adopted in the heavier internal combustion engine design. It allows the use of cylinder barrels of material specially designed to withstand the wear conditions, and this forms an additional application of the spun-sorbitic process of great promise.

Smaller Use of Pig Iron in Open-Hearth Furnaces

Charge Proportioning as Affected by Price Ratio Between Iron and Scrap Shows Close Watching of Markets

CALCULATIONS of the proportion of pig iron and of scrap used in open-hearth charges in the first quarter of 1928 indicate that the pig iron constituted under 45 per cent of the charge and scrap over 55 per cent. The fact that steel ingots in the first quarter of the year made a new high record in tonnage, whereas the output of pig iron was more than 10 per cent below a high record and was exceeded on nine previous occasions, suggested an inquiry into the situation. This study has covered the first quarters of six separate years—1928, 1925, 1923, 1920, 1917 and 1913.

Without going into details year by year, the figures



Close Parallelism Is Shown Between the Calculated Percentages of Pig Iron Used in Open-Hearth Furnaces and the Ratio of Scrap Prices to Those of Pig Iron

for 1928 may be analyzed to show the method of approach. Total ingot output is placed at 12,644,000 tons. Of this amount, Bessemer steel accounted for 1,644,000 tons, open-hearth steel for 10,900,000 tons, and crucible and electric steel for about 100,000 tons. Steel-making iron in the quarter aggregated 7,018,000 tons. Of this the Bessemer converter absorbed 1,770,000 tons, on the basis of a 9 per cent loss in conversion, with 2 per cent of the ingot tonnage made up by use of scrap. This left 5,248,000 tons to be used in the open-hearth furnace. Castings have averaged recently 2.8 per cent of the total steel output. On this basis, 148,000 tons of the steel-making iron may be assigned to castings.

There is left for open-hearth steel ingots a total of 5,100,000 tons of steel-making iron. If we assume an 8 per cent conversion loss from this iron, most of which, of course, is a loss of weight through oxidation of metalloids, the amount of pig iron represented in the ingots was 4,692,000 tons.

Figuring a 2 per cent conversion loss on account of the scrap used in the open-hearth furnace, we find a total scrap consumption of 6,439,000 tons indicated. Adding this to the steel-making iron going into the ingots gives a total charge of 11,539,000 tons, of which 539,000 tons, or 4.7 per cent, represents the total loss in conversion. Of the total charge, pig iron represented a little under 45 per cent and scrap a little over 55 per cent.

Similar figures for the five other years' study show pig iron at a maximum in 1925, when the cost of scrap with relation to the cost of pig iron was considerably higher than in 1928, and a minimum in 1917, when the cost of scrap. with relation to pig iron, was considerably lower than in 1928. Other years showed varying percentages of pig iron used in the charge, as indicated in the diagram. Alongside the curve of iron in the charge is the curve of price ratios of the two commodities.

CHARACTERISTICS OF FIRST QUARTER-YEARS

	Open-Hearth Charge		*Prices of Components*		Price
	Pig Iron	Scrap	Pig Iron	Scrap	Ratio
1928	44.3%	55.7%	$18.59	$13.69	0.736
1925	54.1	45.9	23.35	18.42	0.789
1923	51.6	48.4	28.76	22.16	0.770
1920	47.7	52.3	41.42	25.54	0.617
1917	40.2	59.8	32.87	22.23	0.678
1913	48.5	51.5	17.45	13.39	0.767

In establishing the price ratio the average of heavy melting steel at Chicago, Pittsburgh and Philadelphia was placed against an average of three steel-making pig iron prices—Bessemer iron at Pittsburgh and basic iron at Valley furnace and in eastern Pennsylvania. The scrap average was $13.69 in 1928—the lowest in the entire list, except for the $13.39 in 1913. Similarly, the pig iron average of $18.59 in 1928 was lowest, with the exception of the $17.45 in 1913. The ratio between the two in 1928 was 0.736 (scrap price divided by pig iron price) which compares with a maximum of 0.789 in 1925 and a minimum of 0.617 in 1920. The table gives these ratios and prices, alongside the calculated percentages of pig iron and of scrap in the charges year by year.

Useful Copper Alloys, Old and New

High-Copper Brasses Needed to Resist Corrosion Cracking—Copper Hardened with Silicon and Manganese or Nickel Has Strength of Mild Steel—Copper-Nickel Alloys Favored for Quality Hardware

BY WILLIAM H. BASSETT*

PRACTICALLY every article made from sheet copper is made by mass production methods. Faulty material disturbs the orderly sequence of operations and, in addition, requires expensive inspection and unbearable rejection of finished product.

Rolled and Drawn Copper Requires Rigid Control of Ingot Metal

Modern electrolytic refineries have their methods so well under control that the product meets all requirements if properly fire-refined and cast. The "if" in this case is important. It is necessary that the melted cathodes should be saturated with oxide to dispose of sulphur and that the copper should then be poled to the proper pitch or set. Sometimes these operations are slighted; the result is that the rolling mill produces seamy or slivered sheets or strips.

The condition of the molds, their temperature, and the temperature of the metal are all important to good copper cakes, wedges or wire bars. Cracked and burned molds leave rough places and porous spots. Molds which are out of shape or cracked make shrinkage cracks which gap open when hot-rolled. Dampness means porosity. Drops of oil mean porous or honeycombed areas. Poor or irregular dressing means mold wash in the castings. Cold copper or slow pouring means cold sets.

"Low set" copper means high mill scrap and trouble in subsequent processing. It produces shrink holes, which change in the sheet mill to blisters and slivers. High oxygen may increase tensile strength to a slight degree, but it decreases toughness, perfection of surface and, to some extent, resistance to corrosion. Oxygen in copper is not in solid solution. The oxygen eutectic separates between the large bladed crystals and is the source of the dark or dull patterns on polished copper sheets. These matters were carefully and thoroughly worked out years ago, and the experience which has followed confirms the wisdom of the conclusions then arrived at.

High Copper Alloys Do Not Season-Crack or Dezincify

Yellow brass does not easily corrode, but when used in engineering work and exposed to outside atmosphere it has two bad habits: One is season or corrosion cracking, and the other is dezincification. Experience shows that brass which season-cracks also dezincifies in the presence of slowly acting corroding agents. The opposite statement, that brass which will not dezincify will not readily season-crack, is likewise true.

We have observed season-cracking under atmospheric corrosion at the seashore in brass containing 75 per cent copper, and we have also observed dezincification at the same composition. We have never observed either season-cracking or dezincification in brass containing 80 per cent copper and, consequently, are of the opinion that at 80 per cent copper brass is actually a solid solution of zinc in copper at all temperatures, and behaves in all respects as we believe a solid solution should. It is evidently best not to approach too nearly a saturated solid solution.

Perhaps under the extreme conditions of internal stress and corrosive attack, all metals are subject to the intercrystalline fracture which we know as season-cracking. Copper when extremely hard-drawn will not season-crack when attacked by mercurous nitrate or ammonia. But the effect of the corona discharge from high tension conductors on the atmosphere produces compounds which, if absorbed by moisture and held by fibrous material in long contact with very hard-drawn copper, may produce such cracking. Long exposure to moist ammonia salts may bring about cracking in 80:20 brass under severe internal stress. Conditions of this kind are so seldom met in actual service that, in spite of the misgivings of some engineers as to the reliability of alloys containing any zinc whatever, the low or red brasses are good engineering materials and safe under atmospheric or aqueous conditions.

Bronzes are somewhat less corrosion-resistant than the red brasses, and are more subject to the stress corrosion fracture.

The length of service to be expected from brass pipe has been questioned. Nearly always the pipe will outlast the building in which it is installed. In some districts the water supply is such that dezincification has been set up in the Muntz metal pipe (60:40) commonly supplied, and on this account a number of the manufacturers are supplying as standard an alloy containing 67 per cent copper. Red brass (85 per cent copper) is being used where the water supply is known to be particularly corrosive in character, and this alloy is advocated by some metallurgists, including the speaker, for a general purpose material, and is being used in increasing volume. We have recently heard of the use of compressed ammonia gas for testing water pipe installations. Red brass would stand it, but of course yellow brass cracked badly.

Various Forms of Hardened Copper

Several new copper alloys not subject to stress corrosion have recently been proposed and seem particularly adapted to new uses in engineering construction, since they have greater strength and rigidity than possessed by the older copper alloys.

I desire to speak particularly of the copper-silicon alloys. In 1905 E. S. Sperry proposed the use of copper-silicon alloys for springs and for other purposes for which the copper-tin bronzes were used, since silicon is about two and one-half times as effective as tin for strengthening copper. But no one succeeded in arriving at a practical alloy containing more than a small fraction of a per cent of silicon. "Silicon bronze" has been made for a considerable time, but this was merely copper-tin bronze fluxed or deoxidized with silicon, and generally contained only 1 or 2 per cent of tin.

On May 26, 1925, Charles B. Jacobs patented an alloy of silicon and manganese with copper. This alloy was called "everdur" and the formula is copper, 94.4 per cent; silicon, 4.5 per cent, and manganese, 1.1 per cent, when it is used for making castings. Copper, 96 per cent; silicon, 3 per cent, and manganese, 1 per cent, is the analysis when it is to be rolled or drawn.

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*Technical superintendent and metallurgist American Brass Co., Waterbury, Conn. This is a condensed version of an informal after-dinner talk at the Institute of Metals, Feb. 22, 1928.

It is particularly corrosion-resistant to hydrochloric acid and chlorides. It is readily cast in sand molds and takes the place of gun-metal and bronzes. It can be easily hot-rolled, cold-rolled or forged. It can be drawn, spun or worked the same as other ductile metals. Its physical properties in the wrought form are similar to those of mild steel, and it is an excellent engineering material. It makes excellent bolts and rivets and may be either hot or cold-headed.

Another silicon alloy is the hardened copper patented by Corson this year. It has the approximate formula: Copper, 95 per cent; nickel, 4 per cent; and silicon, 1 per cent. The nickel silicide is in solid solution in copper at and above 750 deg. C. The alloy may be readily hot-rolled or forged, and is ductile and easily wrought by cold-working when quenched from temperatures above 750 deg. C. When this silicide solid solution is heated to just below a red heat the nickel silicide is precipitated and the material becomes hard and strong, resembling mild steel. The reaction is similar to that used to harden aluminum in duralumin. The engineering uses for such material are evident.

Unfortunately both the alloys described have high electrical resistance and cannot be used as conductors for power lines. For low resistance and high strength we must continue to employ copper alloyed with cadmium. Copper with 1.25 per cent cadmium can be hot-rolled readily, but this is about the maximum alloy for hot-rolling. This material will make power cables with strength up to 80,000 lb. per sq. in. and with a conductivity 89 per cent that of pure copper. A small percentage of tin or zinc can be used in connection with cadmium in alloying copper, and in this way higher strengths can be obtained but, of course, with some sacrifice of conductivity. Copper with about 2 per cent cadmium as a maximum can be cold-rolled, but the metal is not sufficiently resilient to replace tin or silicon in spring bronze.

Copper-Nickel Alloys Used Increasingly for Hardware

Stronger alloys of copper suitable for engineering and architectural purposes include the copper-nickel alloys. Those carrying 18 to 20 per cent nickel and those carrying about 30 per cent nickel are particularly attractive where easily-worked corrosion-resisting white metal is desired. It is usual to add to these alloys a small amount of a third and, at times, a fourth element which goes into solid solution with the nickel and copper, and acts to deoxidize and desulphurize. They are very malleable and ductile, strong, and of great ornamental value.

These alloys are being used in increasing volume for plumbing and architectural purposes, both in castings and wrought forms as tubes, sheet and rods. They are much superior to plated metal, whatever the plating may be, for they do not have a surface which will wear off with use or change character with the combined action of moisture and scouring.

Urges Performance Standards for Electrical Products

To Supply User with Apparatus of Best Possible Qualities in Respect to Durability, Operating Cost, Etc.

ADOPTION of minimum standards of performance for electrical products, as the next logical step in the standardization program of the electrical industry, was recommended by W. S. Rugg, vice-president Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., who was the principal speaker at the second general session of the policies division, National Electrical Manufacturers Association, in Chicago recently.

"If electrical manufacturers in the United States are to maintain their place in the world market, and at the same time maintain a scale of wages which will permit our present or an advanced standard of living, this must be done through an increased attention to the costs of production and distribution. To achieve this, there must be a degree of standardization sufficient to maintain a given model, if the expensive machinery necessary for its production in quantity is to be justified," said Mr. Rugg. Successful standardization already accomplished by the industry on apparatus characteristics, such as capacity, speeds and dimensions, should be followed by establishment of quality levels of performance, in Mr. Rugg's opinion.

Regarding the minimum standard of performance as a direct means of achieving economy and efficiency of production, and, above all, of insuring the user of apparatus against unbalanced design and performance, and generally unsatisfactory service, Mr. Rugg described the ideal minimum standard as accomplishing a balance among:

1. Lowest cost of manufacturing and distribution.
2. Greatest adaptability to the purpose for which the apparatus is to be used.
3. Greatest durability, or length of life.
4. Lowest cost of maintenance.
5. Lowest cost of power for operating it.

Such standards should be developed to meet the interests of the major groups concerned. These are the manufacturer, the application engineer, the manufacturer of power and the user. The standards should be so adjusted as to require no immediate undue cost of redesign and retooling, and to permit a gradual raising of the standard as the producer's skill increases.

Minimum standards of performance should be especially advantageous in all lines of electrical apparatus which have been long enough established to have arrived at a more or less stable condition, said Mr. Rugg. "There could be no objection to devices having certain characteristics better than the minimum required standards. There should, however, be a penalty attached to devices in which any characteristic is below the minimum agreed standard."

Cooperative Efforts Urged

Adoption by the National Electrical Manufacturers Association of minimum standards of performance should be made "only after careful consultation with other branches of the industry," said Mr. Rugg, who added: "As time goes on, we will find that the process naturally accelerates by practice and acquaintance, and it would be but a short time when it would become more or less common practice.

"If the various members of the N. E. M. A. could come to a mutual agreement that after a certain date all bids, upon the apparatus for which a minimum standard had been adopted, would contain a statement that the apparatus bid upon conformed to the N. E. M. A. standard, I believe it would effectually bring all manufacturers into line. The salesman of a manufacturer who had adopted the standard would naturally call attention to this fact and would make it a selling argument. The salesman of a manufacturer who had not adopted it would, therefore, continually urge upon his manufacturing plant and engineers to get in line. In other words, a manufacturer who would not conform to this minimum standard would have to make excuses."

German High-Tonnage Furnaces

Details of Construction—Much Greater Weight Than in United States—Exceptional Control Methods

BY F. H. WILLCOX*

FURNACE construction in Germany is an inversion of ours, i. e., a brick stack with steel bands with cooling plates set in, and a steel plate bosh and tuyere jacket without plates, water cooled on the exterior. The whole structure is supported on heavy structural framework extending to the top platform. Even on American-type shells, such as we have adopted for our designs abroad, the Germans insist on heavy structural beams running vertically from top of column to top platform.

Their bells are usually smaller. Linings are 0.9 meter (35½ in.) thick in the inwall. They have our conventional type of stockline protection on the top, where they do not resort to metal tops. Inwall cooling is carried right up to the stockline wearing plates. As a rule they use a cast iron box on 3-ft. vertical centers, the plate having a 7-in. depth on the face and 9-in. horizontal spacing between plates. The end is open and the water under no pressure. The plate is about 20 in. in from the face of lining.

Tremendous quantities of water are used on the bosh, tuyere and hearth jacket, with a sort of pigs-in-clover puzzle run-off arrangement on the bottom underneath the operating floor, to prevent breakouts getting into the sewers. There is not infrequent evidence of breakout. Inwall batters are less than ours on the newer furnaces.

Boshes are higher than here, and do not usually go over 78 to 80 deg. angle, though one finds as high as 84 deg. However, the same hearth and bosh diameter seems to hold. It is as if one ran a 10-ft. 80-deg. bosh up to a 13-ft. 84-deg. bosh, the hearth and bosh diameter remaining say 20 ft. 6 in. and 24 ft. in each case. The opinion was frequently expressed that, for their material and rate of driving, it was better not to go beyond 78 deg. bosh angle or over 1300 deg. Fahr. blast temperature.

Large Furnaces Not Uncommon

Furnace sizes vary. Perhaps the best relative tonnage figure was a maintained average of 915 tons on a furnace of 16-ft. 5-in. hearth, 22-ft. 6-in. bosh, 14 ft. 9 in. high, 17-ft. stockline, having a height of 84 ft. and a cubic capacity of 22,300 cu. ft. This was on Swedish, minette and German ores, using eight large tuyeres and 1325-deg. blast. From there one may find increasingly larger hearths, up to the largest encountered during my trip, of 20 ft. 6 in. with a 24-ft. bosh and total cubic capacity of 33,000 cu. ft. on a height of 95 ft. This stack used Swedish magnetites, part nodulized, and was credited with 985 tons average production on about 2050 lb. coke. I might say that I am using American tons; the output is about 1002 metric tons.

Of the plants and operating furnaces seen, I would credit 10 with better than an 800-ton production rate. The remainder would average under 600 tons. I secured no published figures, but would believe the average rate per steel works furnace in the Ruhr to be some 100 or more tons less than a similar American figure of the Chicago-Pittsburgh districts.

High Outputs Being Made

Speaking now of high-tonnage furnaces, some remarkable rates are being maintained. For instance, one plant makes 930 tons a day on a 22,300-cu. ft. furnace, iron notch to within 2 ft. of closed bell. This is done without outside scrap on a yield of 54 per cent. The same size stack in 1914 made 550 tons. The wind volume is 120,000 cu. m. per hour, or 70,000 cu. ft. per minute, blown at 14 lb. pressure through eight tuyeres. A blast temperature of 1300 deg. Fahr. is carried.

Over a million tons had been produced on the lining, with an expectation of 1,500,000 tons. The coke rate of 2080 lb. seemed high, as did the top temperature of 650 or 700 deg. Fahr. But the rate of driving is such that the retention period of gas and stock is abnormally short, and, besides, the coarse burden of Swedish and minette ores would seem to give a restricted gas-to-ore contact factor.

Low-silicon Thomas iron is produced and the slag runs 34 to 35 per cent Si, 10 to 11 per cent Al_2O_3, 5 to 6 per cent MgO and 45 to 46 per cent CO, with sulphur of 1.5 to 2.0 per cent. The furnaces are cast six, seven and even eight times a day, dependent upon the mixer demands. Parts of casts are put into the sand beds, there being no pig casting machines at these plants. In a couple of plants the iron is run out in sheets, as we run into hot slag pits, and broken with a ball for open-hearth charging.

The blast pressure of say 14 lb. is not at all regular, though it moves within narrow limits, and is seemingly quite as much affected by blast volume as by furnace conditions. It was rare indeed to see evidence of hanging after cast. The volume of air delivery is not regular, as we consider it. The blowers seem to follow the furnace more than, as here, the furnace following the blowers. In fact, it is possible to see variations in blast volume of 10 per cent where the high-tonnage furnaces are driven by a group of old blowers, and I would consider a 6 or 7 per cent variation quite characteristic.

German tuyeres are huge affairs, seemingly as big as some of our coolers, and actually having a diameter of 8½ to 11½ in. Three plants were using Venturi tuyeres, with a diverging instead of converging nose. Inspections of cost sheets were quite convincing as to the change in practice effected, notably a decrease of nearly 2 lb. in blast pressure and an increase of 5 per cent in tonnage. They are said to give a week or so of rough practice when introduced, as may be imagined.

Use Much More Coke Than We Do

The foregoing description of practice is typical of those plants where 900 tons—and even 1000 tons—are being produced, and with furnaces up to 32,000 cu. ft. capacity. It always seemed to me that the coke rates were high and this was sometimes agreed to, but followed by the statement that it did not matter particularly, because there was use for all the gas. This is true enough, but it would seem a bit inconsistent with the use of high-efficiency stoves and gas engines and heat research.

One can find creditable records of coke consumption, and at one plant a low rate of 1750 lb., day in and day out, but it seems to me their coke rate is distinctly higher; for basic iron, I would say, easily 200 lb. a ton higher than ours. Three factors probably contribute: very intensive cooling of furnace walls, a somewhat coarse ore and limestone mix, together with refractory ores, and a rather inflexible charging system. Add to this a fast-driving rate, up to 78 lb. coke per cubic foot

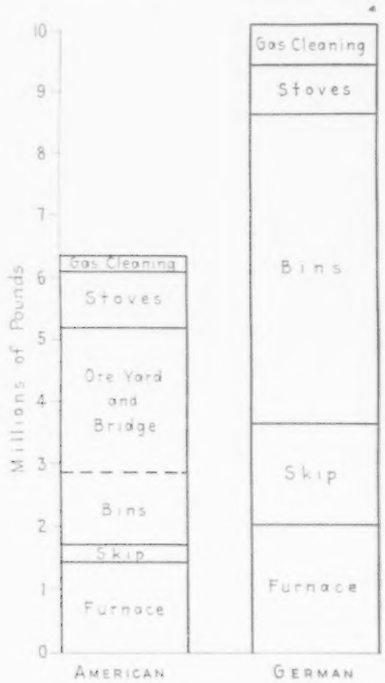
*Vice-president Freyn Engineering Co., Chicago. This concludes the article at page 803, THE IRON AGE, March 22, being an abstract of an address before the Eastern States Blast Furnace and Coke Oven Association.

of furnace capacity (and higher in one or two instances).

In my opinion, it is a mistake to attribute the fast-driving rate of some of the Ruhr furnaces to a single cause—for instance, coke, sinter, slag, open charge, mixture of hematites and magnetites—just as it is a mistake to attribute all of our trouble to coke. Many use only 15 per cent sinter, and even less. One plant uses sinter as a major component and can use higher heat and gets lower coke consumption.

However, there are furnaces on our Eastern seaboard using from 40 per cent sinter, with foreign lump hematites and fine magnetites and hematites, up to 85 per cent sinter, which exceed anything that can be observed abroad on the same ore mixes. This applies to coke consumption, labor rate and cost above.

As to driving rate, you can observe here a rate of 3.4 tons per 100 cu. ft. as against 3.8 tons abroad.



GERMAN Blast Furnaces Are Much More Massive Than American. Only in the case of the stoves do the American weights exceed the German

However, the 3.4-ton rate is with a coke rate of 1700 lb., and the 3.8-ton rate with coke of 2000 lb. "There is more than one road to Rome," and industrial and economic conditions dictate the road to be taken. Germany has virtually reached her pre-war production rate of pig iron, replacing the Alsace-Lorraine tonnage formerly allotted to Germany.

Massive Construction in Europe

Speaking of European plants in general as against American, perhaps our plants do not have the elaborations and refinements that one finds abroad. But they are simpler, and less expensive to build, even though more sturdy in the furnace itself. A comparison of weight is given, both typical, I believe:

	American	German
Cubical contents.....	20,000 cu. ft.	21,200 cu. ft.
Weights:		
Furnace	1,340,000 lb.	2,012,000 lb.
Skip	260,000	1,580,000
Bins	950,000	5,000,000
Stoves	900,000	800,000
Gas cleaning	250,000	700,000
	3,700,000 lb.	10,092,000 lb.

To compare the bins being used as ore storage we should add the equivalent of an ore yard and bridge, but not including car dumper, as both are hand unloading propositions. This would add about an equivalent 2,300,000 lb. to the American weight, giving 6,000,000 lb., against 10,100,000 lb.

Cost Figures

As to operating costs, if we put raw materials on a parity, labor and supplies on a parity, the cost of a ton of pig iron is approximately $2.10 higher for a Ruhr-type plant than at a modern American plant, using the same materials and labor and material costs.

As to construction cost, the typical Ruhr District plant with its bins, heavy hoist and furnace, elaborate gas cleaning and gas engines, will cost approximately $26 per ton per year, as against $20 per ton per year here.

As to labor, taking a single-furnace plant, they will run 5 tons per man per day, as against our 6 tons per man per day. I am taking modern outfits in both cases and avoiding extremes, though using a 900-ton German base.

Furnace practice itself is, if anything, easier on men and supervision force there, due to physically better average coke and ore and a higher proportion of beneficiated fines and low-grade iron-bearing materials.

The present trend, not only at blast furnaces but in the steel works, is what they call "rationalization." It is another word for "Americanization," or, more properly, "Taylorization." Intensive study is given man-hours, industrial wastes, the number of men carrying 10,000 brick, unloading and loading materials, ultra-microscopic study of cost of above, etc. A considerable number of men of the Waermestelle are engaged in this stopwatch work. It is characteristic. They must be said to put in a broad, solid foundation.

Environment Dictates Many Conditions

From an economic point of view, an opinion on the fundamental conditions may serve to conclude. German furnace design differs strikingly from American. This has arisen from environment. Most works are held within definite limits, being inclosed by growth of cities; they have had to increase output in the existing units with existing equipment. This tendency has been strengthened by the growing invested capital per ton of steel or iron. German ore sources have changed within 10 years and include many inferior materials.

This has afforded an opportunity for development in design and practice with every advantage of modern research and control, which is unique, and has been effectively utilized. Ruhr coke is exceptionally good. Consequently German blast furnace has attained a rate of production, a degree of durability and a heavy type of construction that is, with exception of coke consumption, eminently gratifying and creditable.

Anti-Injunction Bill Condemned by James A. Emery

Denunciation of the anti-injunction bill, introduced in Congress by Senator Shipstead, as fundamentally and constitutionally wrong was voiced by James A. Emery, general counsel of the National Association of Manufacturers, at the twenty-second annual dinner meeting of the Indianapolis branch of the National Metal Trades Association at the Columbia Club April 2. Andrew J. Allen, local branch secretary, reviewed labor conditions in the metal trades of Indianapolis.

In an election conducted by referendum W. D. Hamerstadt, Rockwood Mfg. Co., was named president for the coming year; George P. Torrence, Link-Belt Co., vice-president, and L. M. Wainwright, Diamond Chain & Mfg. Co., treasurer. Fred Hoke, Holcomb & Hoke Mfg. Co.; O. B. Iles, International Machine Tool Co., and James H. Hooker, Sinker Davis Co., will serve for a two-year term on the executive committee. The eleventh district committee during the next 12 months will consist of Eugene Gruenewald, Ross Gear & Tool Co., Lafayette, chairman; John T. Wilkin, Connersville Blower Co., Connersville; D. O. Thomas, Muncie Products Division, General Motors Corporation, Muncie; R. P. Johnson, Warner Gear Co., Muncie; and Henry Langsenkamp, Langsenkamp-Wheeler Brass Works, Indianapolis.

During the afternoon preceding the meeting a State conference of Indiana manufacturers and business men was held at the Hotel Severin, Indianapolis, at which Mr. Emery discussed pertinent legislative matters.

Railroad Bridge Made by Arc Welding

Skew Bridge for Heavy Freight Movement Built of Plates and Standard I-Beams Without Use of Rivets

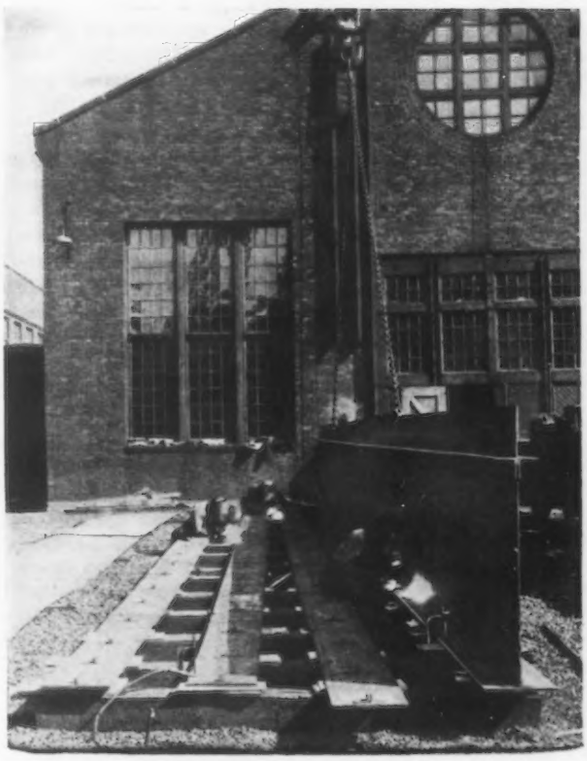
BY A. G. BISSELL*

ARC WELDING has been used to repair several bridges, both highway and railroad, but the first all-welded bridge to carry rail traffic has just been completed. It is a single-span girder railroad bridge of the through type at Turtle Creek, Pa.

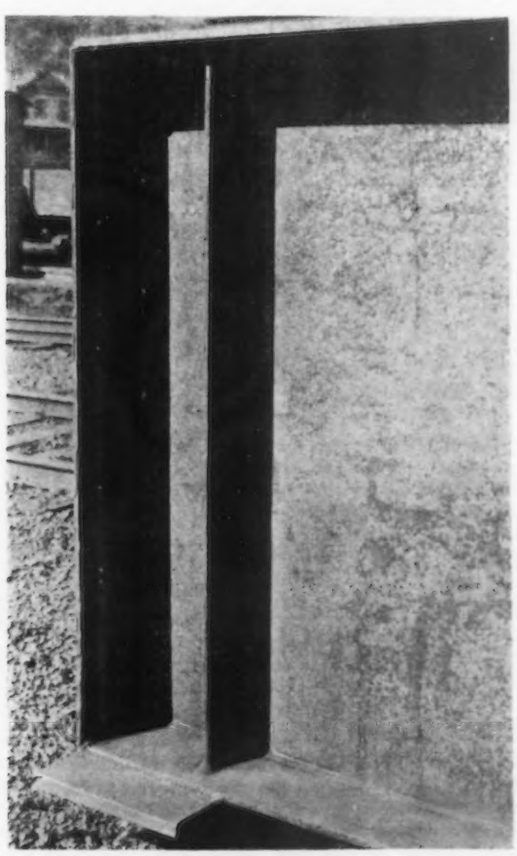
The two main girders used in this bridge are 4 ft. 9¼ in. deep and 53 ft. 9 in. long, and weigh about 11,600 lb. each. These girders were constructed outdoors at the plant of the Westinghouse Electric & Mfg. Co. at East Pittsburgh. Flanges are built up of three plates; the plate attached to the web is ⅝ in. thick by 1 ft. 2½ in. wide. To this plate, by means of a fillet weld along the edges, is attached a cover plate ½ in. thick, 1 ft. 3¼ in. wide and 38 ft. long, and a second cover plate ½ in. x 1 ft. 4 in. x 22 ft. is attached to the first cover plate. The longest plate is the narrowest, and by the methods of construction adopted the slight extra width of the underlying plates forms a little shelf for retaining the molten weld metal.

These cover plates were carefully assembled on some long timbers, and edge-welded continuously on both sides. Small angles were then attached along the center line to act as guides for the ⅜ x 54-in. web plate. When the web plate was securely attached to the flange plate, the small clip-angles were removed. The 6-in. angles shown bolted to the web plate were used to stiffen the web during this preliminary work and to make handling easier. They were removed, and the bolt holes were filled with weld metal. Web stiffeners in the form of ⅜ x 4-in. bars, 4 ft. 6 in. long, were then welded in place. Affixing these web-stiffeners before the second flange was attached made it possible to weld the joint between the stiffener and the first flange-plate in the "down-hand" position.

*Arc welding engineer, general engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



Building Main Girders. Small clips to aline web and flange removed after joint completed. Stiffener angles at top of web bolted on temporarily



Close-Up of Joints at End of Main Girder

The second flange-plate also had small angles located on it, and the partially completed girder was picked up by a locomotive crane, turned over, and fitted between the angles on the flange, and then welded in place. The end is finished by a ⅜ x 14½-in. plate.

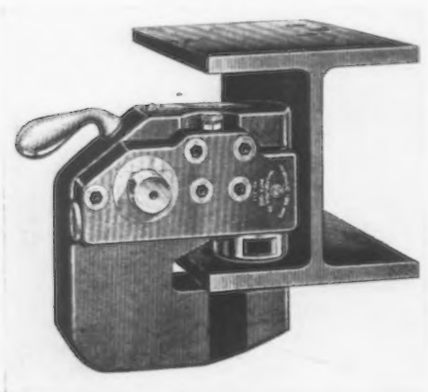
After the two girders were erected on the abutment walls, the floor system of I-beams was erected. Main cross beams rest on the lower flange of the girder, and a continuous weld was run clear around connecting them to the web plate. Stringers for carrying the rails are 18-in. I-beams, resting on the lower flanges of the cross beams. These members were lined up and tacked, then welded solid. To make these stringers continuous, a ¾ x 5 x 24-in. plate is passed through a slot cut in the web of the floor beam at the upper flange of the stringer. These plates are welded solidly to the upper flange of the stringers and to the web of the floor beam, giving a continuous stringer the full length of the bridge to carry the track ties. Three-inch angles are connected between the bottom flanges of the girder and the floor beam for diagonal bracing. Suitable sway bracing was made of plates and welded between top flanges of floor beams and main girders.

In the construction of this bridge, 1067 linear feet of ⅜-in. fillet wells and 501 linear feet of 5/16-in. fillet welds were used, requiring about 500 lb. of electrode material. Welding required 320 man-hours.

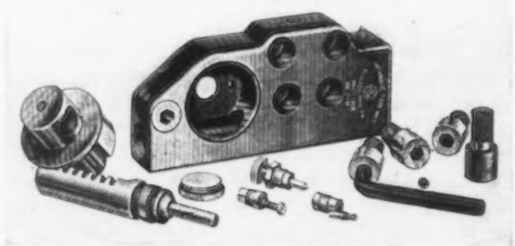
Tests were made on this bridge to determine the deflection and vibration by running a 185,000-lb. locomotive over it at various speeds.

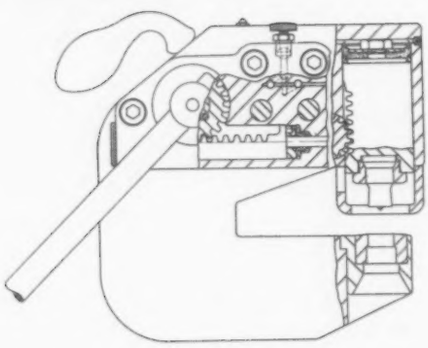
Hydraulic Unit Applied to Portable Punch

A new hydraulic unit of compact and simple design, one application of which is to the portable punch head here illustrated, has been brought out by the Hydraulic Tool Works, Philadelphia, with sales offices at 350 Madison Avenue, New York. Other applications of the unit include its use on a line of hydraulic jacks which feature light weight in comparison with the power gen-



Application of the Punch to an 8-In. H-Section Is Shown at Left. Parts that make up the pump body and the pressure cylinder mechanism are at right, and the assembled mechanism is at lower left





erated, the 100-ton jack weighing approximately 90 lb. The pressure medium is oil, which serves also to lubricate all working parts.

The arrangement of the punch head may be noted from the accompanying illustrations. It is made up of a frame, pump body assembly, pressure cylinder assembly, punch and die and pump handle. All parts are of special steel, heat-treated, and the use of this material, together with the rugged design and self-lubrication of the working parts, is claimed to provide unusual durability.

The type A tool, pictured herewith in operation on an 8-in. 50-lb. H-section, is designed to punch holes up to 13/16 in. in diameter, or a ¾ in. square hole, through a flange ⅝-in. thick. The throat is of a depth that permits punching a hole the center of which is 1½ in. from the web of an 8-in. H-section. The length of the tool is 8¾ in., the width 7 in., and the height 9¼ in. The weight is only 55 lb., which permits the punch to be applied to the work and operated by one man. The tool is operated by pressure at the end of the pump lever, and it is claimed that holes may be punched in less than one minute. The device may be mounted in a vise, or on the floor or bench; for the latter mounting a standard angle plate attachment can be furnished. Means are also provided for securing the tool to the flange of a column, in which position the tool is said to have been used to advantage. The handle shown at the top of the punch head facilitates lifting or other handling of the tool.

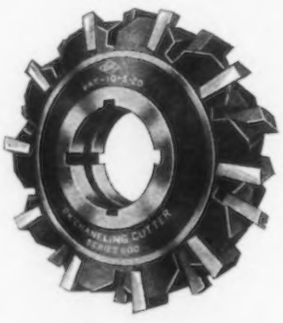
Standard punch and die equipment is employed. All parts are manufactured on an interchangeable basis, and spare working parts may be kept on hand for quick renewal on the job in case of damage. Accessibility of the interior mechanism facilitates replacement of parts when necessary. The valves and other parts contained in the pump body may be taken off the punch merely by removing the five screws shown in the illustration of the pump body parts. The pressure cylinder mechanism, also illustrated, is made up of the ram and its packing, the retracting key, the punch, die holder, stripper, and pump handle.

Fields for which these tools are offered include elevator installation work, structural steel erection, fabrication and erection of outdoor display signs, driving out of rivets and numerous general industrial applications. The hydraulic jacks, to be available later, employ the same type of hydraulic unit and will be offered for a wide variety of application, such as in scale and weighing departments of railroads, for removal of armature shafts on electric locomotive, for removing ingots from molds, etc.

Heavy-Duty Milling Cutters With Blades ¾ In. in Thickness

A heavier line of inserted blade slotting and facing milling cutters than heretofore manufactured by the company has been placed on the market by the O. K. Tool Co., Shelton, Conn. New blades ¾ in. in thickness have been developed, which, as in the previous sizes, are inserted into forged chrome-nickel steel, heat-treated, bodies.

The O. K. milling cutter blade, which is tapered and has a serrated back, fits into a corresponding slot in the body. The tapered surface locks the blade securely in the body, and the serrations permit the blade to be adjusted for wear. The blades are of drop-forged high-speed steel. Any of the standard designs of cutters are made, such as slotting cutters; side mills, either straight or angular; half side mills; face mills, etc. Suitable rake and spiral angle as well as adequate chip clearance are provided, according to conditions.



Tapered Surfaces Lock the Blade in the Body and the Serrations Permit Adjustment for Wear

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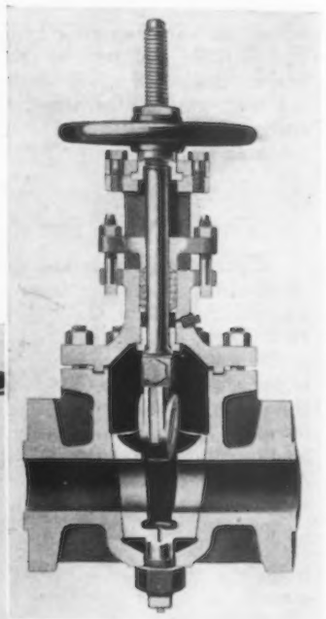
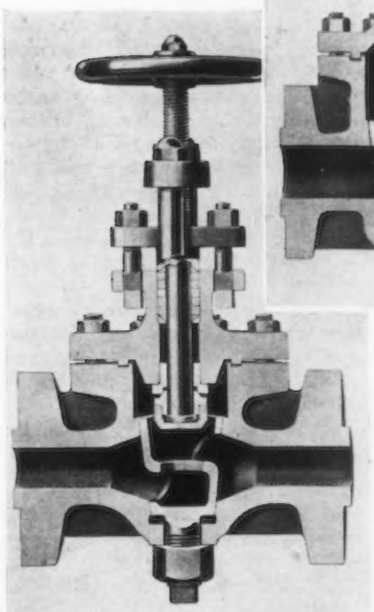
Production of electric power by public utility power plants in the United States was 6858 millions of kwhr. in February, according to the Geological Survey. This compares with 7261 in January and 7214 in December. The daily average in February was the highest ever reached. About 37 per cent of the total was produced by water-power.

Valves for High-Pressure and High-Temperature Requirements

Designed for high-pressure and high-temperature service, a new type of globe and gate valve has been brought out by the Wellman-Seaver-Morgan Co., Cleveland. The valve seats are an integral part of a slightly tapered removable valve cage. The valve cage itself has an external take-up adjustment to compensate for expansion or contraction and to prevent leakage between the walls of the cage and the main valve body. Another feature is that the valve cage may be utilized to shut off the flow through the valve while repairs or adjustments are being made, eliminating the necessity of taking the entire valve body out of the line.



Valve Seats Are Integral With the Removable Valve Cage. The cage has external take-up and may be utilized to shut off flow during repairs



Valve Bodies and Bonnets Are of Forged Steel. Cages, gates, gate bolts, bushings and gate seats are of stainless steel

When repairs are to be made the cage is rotated a quarter turn to prevent the passage of fluid through the valve, and to permit the removal of internal parts, if desired. When the valve has been repaired, the valve cage is restored to its normal position. The valve cage has guides corresponding with the slots in the wedge-type gate, which control the path of travel of the gate and prevent rubbing of the surfaces of the gate and seat.

The valve cage is of novel design in that exteriorly it is circular in cross-section, permitting it to be rotated into position or given a quarter turn to shut off the flow during repairs. The valve seats are flat, permitting closing the valves under high pressures and at the same time allowing the valves to be easily opened. The gate faces are removable and may be replaced when worn, or adjusted when desired.

The valve is so designed that the valve surfaces are released from the seat with a slight movement of the valve stem. This is because of the wedge shape with the center guides, which is said practically to eliminate any sliding action. This prevents both wear and the wedging of the valve faces against the valve seats, which would make it difficult to open the valve.

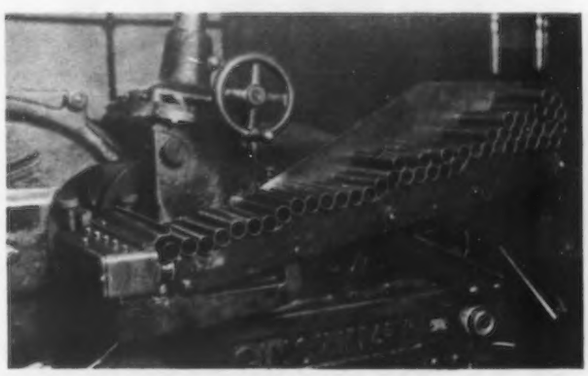
The one-piece valve bodies, as well as the bonnets, are forged steel. The cages, gates, gate bolts, stems, bushings and gate seats are of stainless steel. The gate valve is of the rising stem type and has a straight-way flow, there being no angles at the valve seats. The packing boxes are elevated and have long depth of packing, with a large air chamber below the packing. The body and cover flanges have tongued and grooved joints for soft steel corrugated gaskets. The globe valve has a body and bonnet with either inside screw or outside screw and yoke, and the removable cage construction allows full capacity openings through the valve.

The valves are made in both types to meet the most exacting requirements of the highest temperatures and pressures used in steam plants, oil refineries, pipe lines and in hydraulic air and gas lines. The Globe valve is made in ¾-in. to 3-in. sizes and the gate valve in 1-in. to 6-in. sizes, although larger sizes of the latter, up to 24-in., can be supplied.

Centerless Grinders Equipped with Automatic Feeding Devices

Description of two ingenious feeding devices for use in connection with centerless grinding machines were features of a paper on "Special Machinery for Mass Production," presented by H. L. Blood, chief of machine design division Western Electric Co., Chicago, at the machine shop practice meeting of the Chicago section of the American Society of Mechanical Engineers, held at the Hotel Morrison, Chicago, March 14.

One of the devices, shown herewith, was designed to feed automatically the steel tubes used for desk stand handles. The tubes are stacked on an inclined rack which has a series of steps that keep the tubes parallel as they roll down the incline and also has the effect of preventing any of the tubes from being carried along on top of others. The tubes roll one at a time on to a series of grooved rollers which are driven by power derived from one of the shafts of the grinder. As the weight of the tubes is not sufficient to provide the traction necessary for feeding them into the grinder, the rollers, which are of soft steel, are mounted on permanently magnetized studs. The frame which supports the studs is of bronze, and the studs are connected at the end opposite the rollers by a bar of soft steel. The studs are magnetized in such a way that alternate rollers are of different polarity. When a tube bridges the air gap between two adjacent rollers it completes the magnetic circuit, and the resulting traction between the tube and rollers is ample to feed the tube into the grinder.



In another attachment, devised for feeding tubes into centerless grinders, the tubes, which are of hard rubber, are laid in a V-shaped hopper. At the bottom of the hopper are two rubber-tired disks which revolve slowly and roll the tubes downward against one side of the hopper, dropping them one at a time upon a moving belt. The belt carries them into a nozzle, the inside of which is arranged so that streams of water impinge upon the tubes and carry them into the machine.

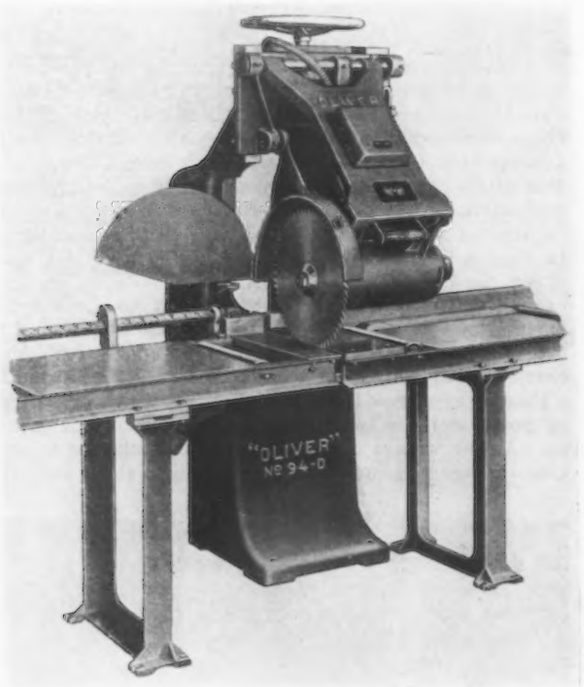
The second annual Indiana heat-treating conference will be conducted by Purdue University at Lafayette, May 10 and 11. The Indianapolis, Fort Wayne and Notre Dame chapters of the American Society for Steel Treating are cooperating with the university authorities in arranging the program for the conference.

Straight Line Cut-Off Saw of Compact Design

Compactness, ease of operation and accuracy are features emphasized by the Oliver Machinery Co., Grand Rapids, Mich., in connection with the straight line cut-off saw shown in the accompanying illustration.

The machine, designated as the No. 94-D Straitline, is self-contained, with the motor mounted directly on the saw arbor. The suspended link mechanism employed for the motor head is said to assure cutting to a straight line and to facilitate operation. Moving parts are light in weight and are arranged to require a minimum amount of movement. Saw tables 20 in. long, 31 in. high and of various lengths are available for use with the machine.

The complete units may be placed back to back, and two of the saws may be located so that the distance between the tables, faced in the opposite directions, is only 18 in. When placed against a wall the distance from the wall to the back edge of the cut-off table is only 18 in. The height of the machine overall is 5 ft. 8 in.



When Two Machines Are Placed Back to Back, the Distance Between Tables Is 18 In. In the unit shown the motor head is locked outwardly and the guard opened for changing the saw

Ball and roller bearings are employed in the suspended link mechanism and pressure-gun fittings are provided for lubricating all bearings. Neither springs nor counterweights are used. It is stated that the balance of the motor head and the design of the linkage returns the motor to its original position and locks it, and prevents rebound of the saw. The entire link mechanism is carried by a yoke with gibbed ways. Vertical adjustment of 3 in. by means of hand-wheel and screw is provided to compensate for wear of saws or for saws of different diameters.

A 5-hp. 3600-r.p.m. ball-bearing motor is mounted directly on the saw arbor. A fan on the motor shaft serves to circulate air and cool the motor. An automatic starter having magnetic contactor with low voltage protection and overload release and push button stop-and-start stations is mounted directly in front of the operator.

Safety features have been given thorough attention. When not in use the saw with its guard is housed inside of the main column. The saw is held back by a safety catch and is only released by a pull on the handle.

Circular saws, dado heads, or solid cutters from 10 to 18 in. in diameter, may be employed, and the machine will carry dado heads up to 2½ in. wide. The maximum thickness of cut by using an 18-in. diameter saw is 4½ in. Stock 2 in. in thickness and up to 20 in. in width can be cut. The automatic cut-off saw tables can be furnished either right- or left-hand. The standard table consists of two sections of 8 ft. each, built up of channels to which steel plates are riveted. Ball-bearing steel rollers are mounted between the steel plates, four rollers to each section. The rollers on the section of the table on which the boards are fed are set ¾ in. higher than the steel plates to enable the operator's hand to catch the boards underneath as well as at the top, assuring quick operation. The opening in the table just beyond the saw provides a chute for end cuttings and short stock to drop into a box below. An 8-ft. gage is provided, the gage being marked in inches and eighth-inches. It is fitted with four adjustable stops.

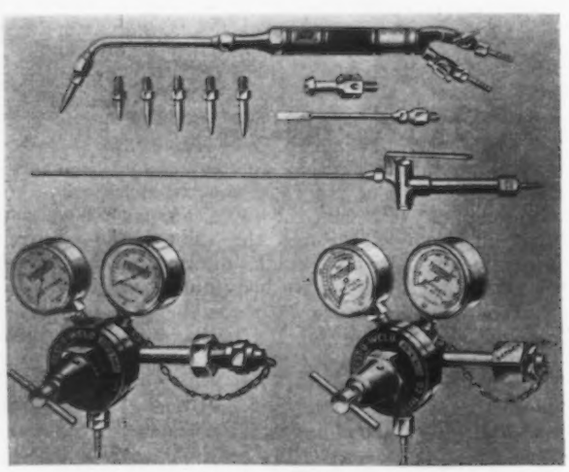
Three New Prest-O-Weld Outfits

Especially to meet the demand of repair shops and sheet-metal shops for inexpensive welding outfits, the Oxweld Acetylene Co., 30 East Forty-second Street, New York, has placed three new sets on the market.

Type W-102-A general purpose outfit, illustrated, is for a repair shop that is equipping itself for any of the modern oxy-acetylene applications—welding, carbon burning, heating and straightening, soldering, brazing, lead-burning and battery work, and radiator repairs. A full line of welding tips, together with a newly designed heating tip and a soldering tip consuming acetylene only, are included. The latter enables the operator to solder the leaves of a radiator in places that would be inaccessible with any other type of equipment.

Another set, called the W-101-A automobile repair outfit, is for the shop which has only an occasional welding job. One large-sized tip is included for frame-straightening or heating. Also an acetylene tip for minor heating and soldering is furnished.

Type W-102-B outfit is recommended for welding light and medium castings; it is also suitable for the sheet-metal shop. This outfit, which includes five welding tips, is adapted to production processes, because the light weight of the blow-pipe with its 3/16-in. hose does not tire the operator even on continuous work.



General Purpose Welding Set

By the addition of a cutting attachment any of these blowpipes may be converted for use in cutting wrought iron or steel.

All rights to the gear chamfering machine formerly manufactured by the Peerless Machine Co., Muncie, Ind., have been acquired by the City Machine & Tool Works, Dayton, Ohio. The sale of this machine, as well as of the Bolender gear grinding chuck, also recently acquired by the company, will be under the direction of the City Machine & Tool Works and the National Broach Co., an affiliated organization.

Vertical Pull-Type Broaching Machine With Twin Hydraulic Cylinders

Increase in quantity and quality of work, and longer life of tools, are claimed for a new vertical hydraulic broaching machine of pull type, which has been made available by the American Broach & Machine Co., Ann Arbor, Mich.

The machine, designated at the V-50, is of the same capacity as the company's No. 3 horizontal broaching unit and full broaches similar in design to those on the horizontal machines are employed. Features emphasized include minimum floor space requirements, 4 by 6 ft., and semi-automatic operation, the duty of the attendant being merely to place the work on the end of the broach and operate the foot control pedals. The broach automatically connects with the pulling head, releases the work and returns to its starting position.

Operation may be noted from the accompanying illustrations, one of which shows the machine with splash covers removed. The lower elevating cylinder carries an extending arm which, in turn, carries a soft brass bushing fitted loosely to the back pilot of the broach. As the operator slips the work over the shank of the broach and applies pressure on one of the foot pedals, the lower cylinder rises rapidly, pushing the broach into the automatic connecting bushing in the pulling head. Slight pressure on the other pedal then starts the pulling rams on the upward stroke, pulling the broach through the work. As soon as the tool has passed through the work, the work drops on the angular table and slides out of the chute into a tote box. The pull rams then reverse and when about 5 in. from the bottom position, automatically release the broach by means of a latch that trips the pull head. This permits the broach to drop back into the lower bushing or receptacle, ready for the next cycle of operations.

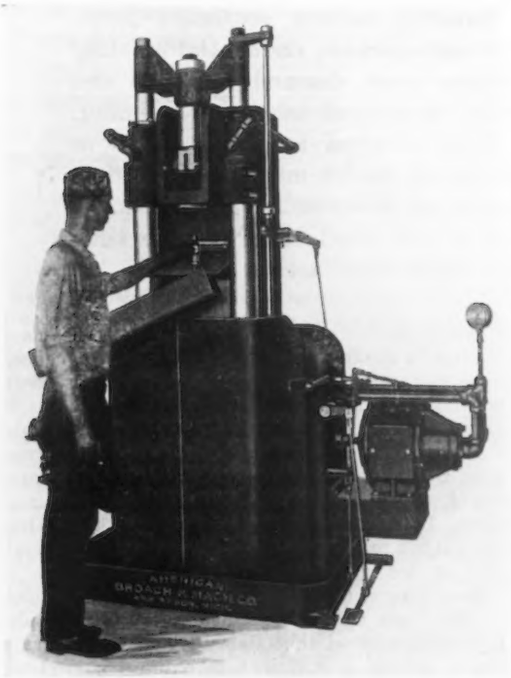
The second illustration shows the machine with the pulling rams in the upper position, the tool having passed through the work, the work has dropped off and the tool is ready to return to its starting position.

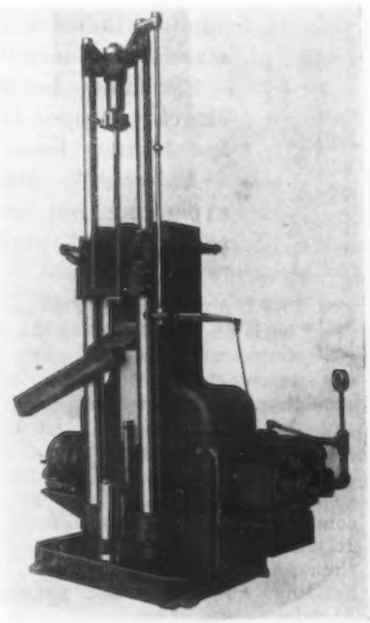
The machine operates by oil pressure. There are two cylinders and two rams, the pressure being applied to the full area of the piston. It is stated that leaks are prevented because there are no packing glands under pressure on the cutting stroke. On the return stroke very little oil is required to fill the cylinder, due to the fact that the pulling rams are 3½ in. in diameter and the bore of the cylinder is 4 in., which arrangement is said to permit high-speed return strokes up to 80 ft. per min. The twin cylinder construction, patents on which are pending, also permits comparatively low construction, the working height required being only 11½ ft.

In arranging the machine so that the operator does not handle the broach, but merely feeds the work and operates the foot pedals, marked increase in production is said to be possible. It is also stated that the broach, in hanging, centers itself, and the work, in being suspended in the same manner, finds its own center much better, and thus prevents troubles encountered in sagging of the broach and the weight of the work. This feature is claimed to result in a better grade of work and increased life of the broach.

The capacity of the machine is 12 tons and the maximum length of broach that can be used is 50 in. The cylinders are spaced 13 in. apart, which permits broaching of pieces up to 13 in. in diameter. Cutting speeds up to 30 ft. per min. are obtainable and return speeds up to 80 ft. per min. The operating pressure is set at 1000 lb. per sq. in. A 10-hp. 900 r.p.m. motor is employed.

The oil tank, of 50 gal. capacity, is in the upper part of the column, and relief valves, surge valves and piping are contained in the lower part of the column. Lubricating pump and piping are provided. The machine weighs 6400 lb.





PULL Broaches Up to 50 In. in Length, and Similar in Design to Those on Horizontal Machines, Are Used. Placing of the work over the shank of the broach is pictured at the left, but the normal operating position is at the right-hand, adjacent to the control pedals. The view at the right shows the pulling rams in their upper position, after the work has been broached and ejected

Manual Alternating Current Motor Starter

A new manual across-the-line alternating current motor starter is being put out by the Cutler-Hammer Mfg. Co., Milwaukee. Designed to meet the need for an inexpensive manual starter, it includes overload cutouts giving complete motor protection; cadmium-plated, double-break, roller-type contacts; and a small safety, dustproof inclosing case.

By breaking the arc in two places the roller-type contacts are said to give several times the life of ordinary contacts. In addition, the contact rollers turn after each operation to present a new contact surface for the next operation. The thermal overload cutouts provide the necessary time interval to take care of starting current inrushes without shutting down the motor. The cover can be opened only when the starter is in the "off" position and all current carrying parts are "dead." Installation can be made without removing the panel from case. All parts are easily accessible for quick inspection.

The McClintic-Marshall Co. will remove its New York offices from 50 Church Street to the 12th floor, 39 Broadway, effective April 14.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Statistical Data Concerning the Chief Consuming Industries Indicate That:

Expansion of activity in chief consuming industries is noted, but demand is not insistent.

Car and locomotive buying in March dropped below the unusually low January level.

Automobile production is clearly expanding, but severe competition is apparent and retail sales are lagging.

Building volume continues large, but may slacken; residential building assures good demand for pipe and nails; structural sales are declining.

Some demand for tank plates in petroleum States may come, as storage of oil is becoming a problem.

Iron and steel exports have been only moderately active.

STEEL production in February, on an average daily basis and allowing for the merely seasonal variations, increased so slightly as almost to warrant the statement that it represented no greater annual rate than did the January output, and the March output also held about level. On the other hand, a large gain occurred in the activity of the chief iron and steel consuming industries. These facts lead to the conclusion that the February steel production was moderate compared with the potential requirements of consumers. It was above normal, but so was the rate of production, and presumably the steel requirements, of the building, automobile and general manufacturing industries.

Judging both by logic and by precedent, there is no reason to become bearish on the steel industry so long as its chief customers are doing so well. Nor is there reason to believe that there is any accumulation of total inventories of steel, including both the inventories of the steel makers and those of the consuming industries, so long as the composite demand line is so far above its usual relation with the steel production curve.

Index of Composite Demand Is High

IN February, the latest month for which complete data are available, considerable gains occurred in railroad freight traffic, building activity, automobile production, general manufacturing (other than automobile and steel production) and in exports. The composite activities in mining and oil declined a little, considering the season, and orders for machine tools decreased somewhat. Our estimate of agricultural purchasing power recovered slightly, but remains considerably below the high level attained last fall. The net result is a gain of about 5 per cent in the index of composite demand, which carries it to the highest level since September, 1926, and warrants the hope that the steel ingot output may continue around present levels for a month or two without proving to be excessive.

Two factors, however, serve to limit the probability that this hope will be gratified. In the first place, it will be remembered that February had an extra working day, which is sufficient to explain something like 4 per cent of the gain in the index of activity among the consuming industries. Preliminary indications are that the composite demand line will decline in March. In the second place, prices and profits have to be considered, and unfortunately neither in the steel industry, nor in most of the consuming industries, are these as strong as is the showing made by the physical volume. The natural result is a tendency toward hand-to-mouth operations.

Conditions in Specified Industries

As to the near future, the indications are on the whole favorable to a sustained high level of steel pro-

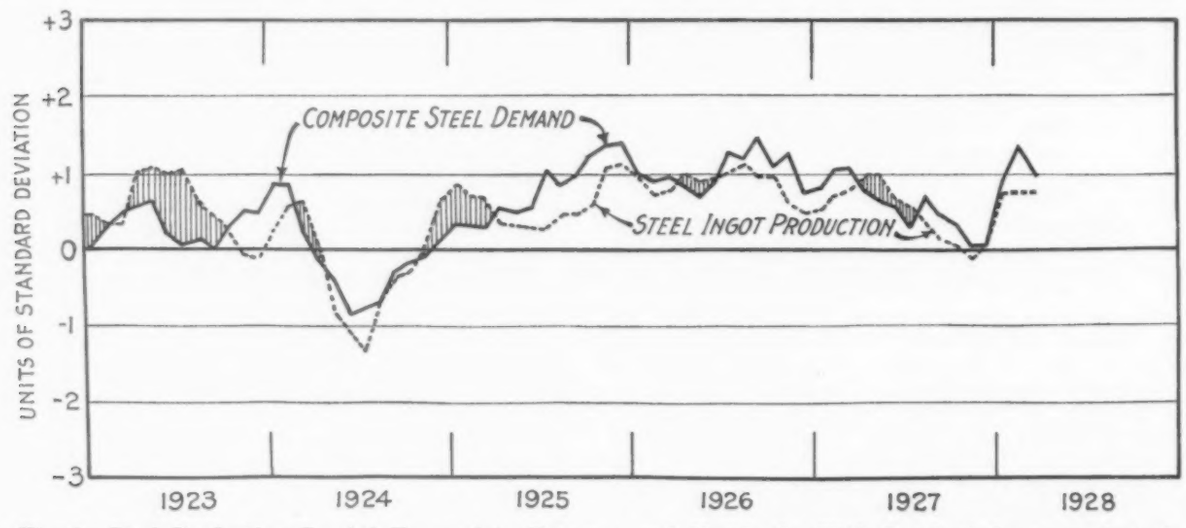


Fig. 1—Steel Production Carried Forward in February and March the High Level of January. But the curve of composite demand has been still higher. The outlook for the immediate future is encouraging

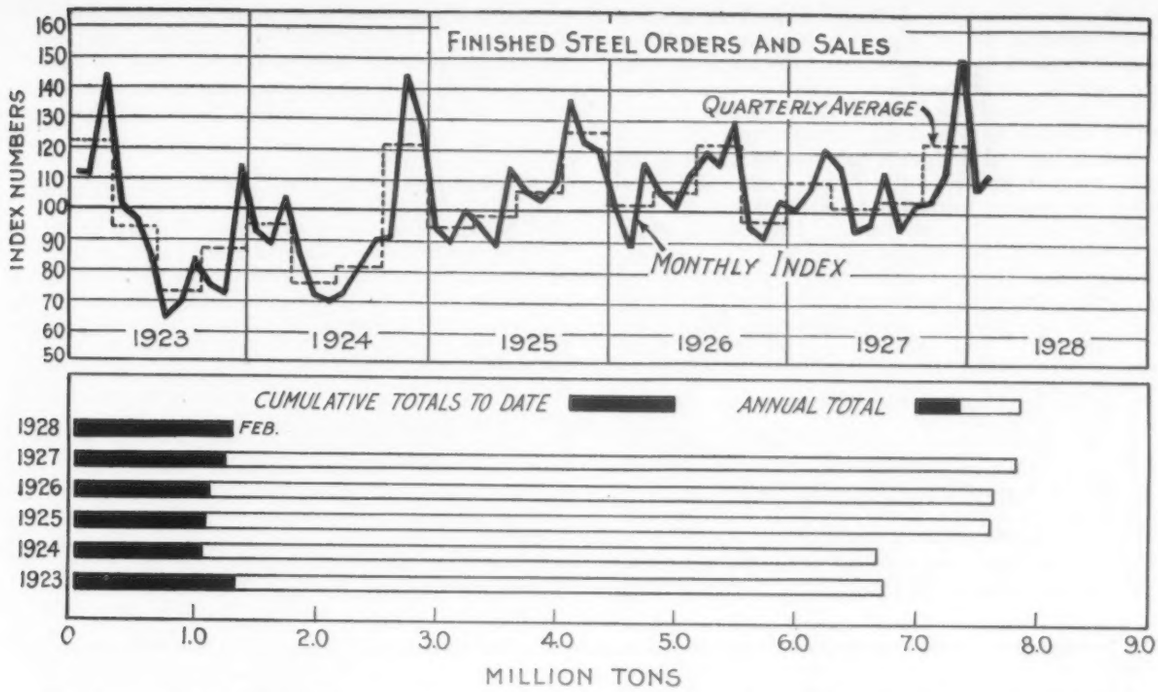


Fig. 2—Buying of Finished Steel Remains Greater Than It Has Been Since 1923. March showed a loss from February. The peak of resultant production may follow shortly

duction. The volume of freight traffic hauled by the *railroads* may be estimated for March and, while it is apparent that such traffic has failed to show the usual seasonal increase over the preceding month, this is not surprising, owing to the abnormal gain shown by a leap-year February. Except for February, the March freight traffic appears to have been the highest since last August, though it was of course much below a year ago. As further gains in the total volume of business are probable, the railroads should continue to furnish a fair demand for steel. February earnings showed improvement over recent months and the net operating income of Class I railroads was probably about equal to that of a year ago. Steel makers must remember, however, that this showing represented economies on the part of the railroads and that gross revenues were appreciably lower than last year.

Manufacturing industries, other than iron and steel and automobile production, showed an upward trend, according to the latest information. Judging by the most sensitive barometers, they are likely to continue upward for a few months. Machine tool orders, which are often barometric, declined in February and, as this is contrary to the usual seasonal trend, it is not a favorable indication, but the volume was still large and much above a year ago. March sales of machine tools are currently reported to compare favorably with the two preceding months.

Building activity in March showed a considerable recession from February—one that was so large as to make it practically certain that the index of composite activity for that month will show a decline. This suggests some diminution in the rate of demand for structural steel.

The February output of *motor cars and trucks* showed a recovery nearly to the level of a year ago. Retail sales of passenger cars were reported to be lagging, particularly in the case of high and medium-priced cars, and evidences of keen competition in the industry are not lacking. Estimates for March show little more than a seasonal gain in production. But a large volume of production continues, and heavy sales by the leading companies appear to have developed in March. It still seems probable that the automobile business will not reach a peak before April. A favorable indication is found in the fact that the manufacturers are proceeding cautiously and their large buying of steel is for current requirements.

In general, the *mining and oil industries* are dull and relatively inactive, our composite index continuing on about the same level as during the last seven months. Large coal consumers are drawing on stocks

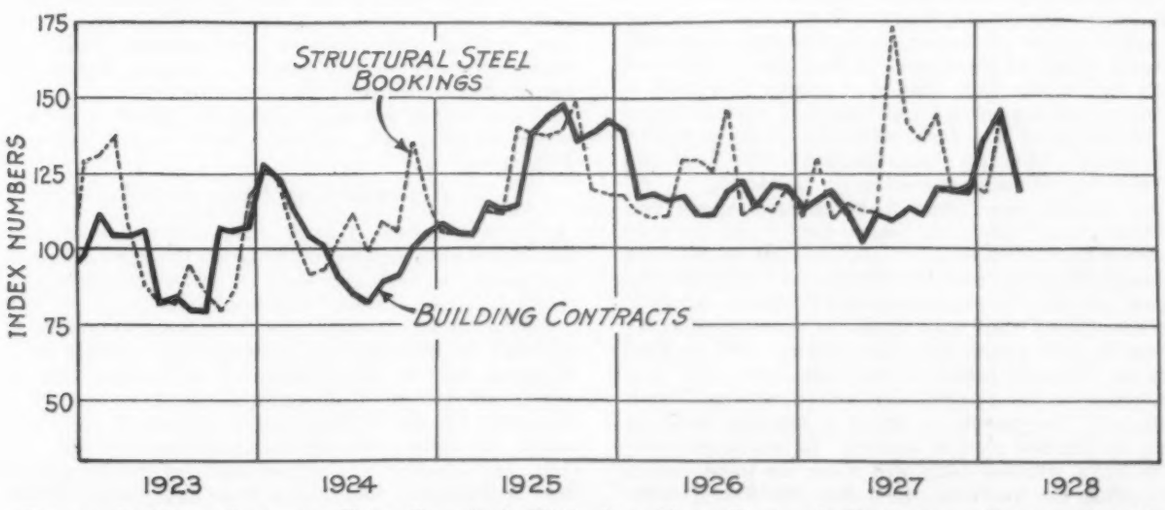


Fig. 3—Building Contracts Have Remained High But Show Signs of Slackening. Structural steel bookings were 45 per cent above the seasonal average in February, but probably dropped off in March

and that reduces current demand. Petroleum production has increased lately, in spite of the fact that drilling activity shows little change from the low level that it has kept for several months. The increase in production is not favorable, although it means some demand for storage tank material. Aside from the gasoline branch, the oil industry has not yet turned its corner. Copper production is fairly stable and, considering the season, was off a little in February.

Improvement has occurred during the past month in *farm prices*, which has tended to increase the purchasing power of farmers a little. But the bulk of the crops has now been marketed and the outlook for 1928, though of course highly uncertain at this early date, seems only fair. The farmers unquestionably have entered 1928 in a stronger economic position than they held a year ago and continued activity in agricultural machinery is to be expected.

Iron and steel *exports* declined less in February than usual, perhaps partly due to the extra day in that month, and to this extent made a good showing.

The strongest feature is the recovery of automobile production to levels above a year ago. As long as automobile, building and general manufacturing industries hold at present high levels the railroads must have a fair volume of traffic, and the demand for steel, as to quantity, will be well sustained at a high level.

Finished Steel Orders Remain Large

IN February, the orders for finished steel continued to hold their lead over other years since 1923. The total orders for sheets, structural steel, castings and fabricated plates in January and February were considerably ahead of the preceding four years. This was partly due to the fact that such orders increased in February. In that month the total was actually above any month since last July, with the single exception of December. This is a clear reflection of the large current activity in the steel consuming industries.

The largest items were found in steel sheets and structural steel, orders for which were large not only absolutely but in comparison with previous years. This fact emphasizes the present importance of the two industries, automobile production and building. In fact, it is noteworthy that such items of finished steel as fabricated steel plates and steel castings fell in February considerably behind a year ago.

A glance at the second chart will show that March is normally the month in which a seasonal peak in orders for finished steel is reached. It will be interesting to learn whether 1928 will show its third month maintaining the tradition. If it does, the first quarter of this year will have seen the largest orders for finished steel that have occurred in the first three months of any year since 1923. There seems little chance, however, that the volume will equal that of the 1923 period. Probably the chief question concerns the March business in structural steel, for the average weekly bookings reported currently appear to indicate a total considerably under that reached in January or February.

Slackening of Building Activity Impends

OUR seasonally adjusted indexes of building activity and automobile production came together in March at a point about 18 per cent above the average for 1921-1927. This compares favorably with a year ago, and tends to confirm the conclusion that steel production in March would be justified at last year's level. One cannot overlook the fact, however, that the *trends* in the two industries appear less favorable, and that the trend of building activity has an excellent reputation as a general business barometer. On the whole, these two industries show signs of slackening.

The square feet of floor space in building contracts rose in March to 88,090,000, which compares with 68,847,000 in February and 87,892,000 a year ago. This increase over February, however, is much less than usually occurs, and the adjusted index for March is only 118.6 against 144.1 in the preceding month. Moreover, the value of contemplated new construction dropped below February and below March, 1927. It is low in comparison with contracts awarded.

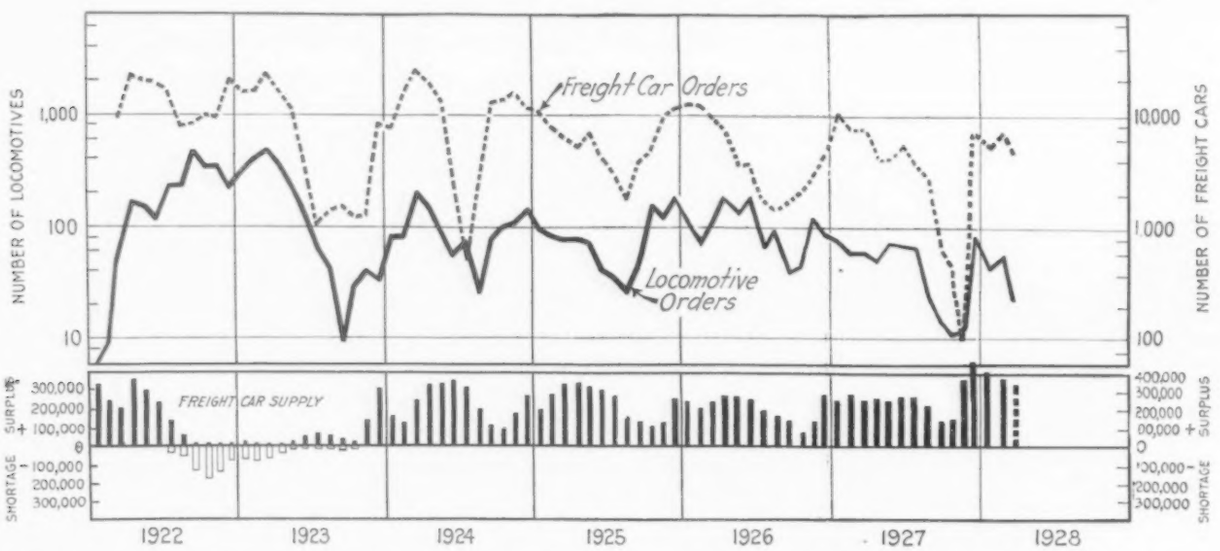


Fig. 4—Locomotive and Railroad Car Orders Have Dropped Below the Low January Levels. And the large surplus of cars does not indicate need for heavy purchases

Bookings of structural steel rose in February and were approximately in the same position with reference to their average as were the building contracts. In that month, both were about 45 per cent above average, making due allowance for seasonal conditions. Probably the index will decline in March. This would conform to the trend of building contracts, and we note that the weekly average awards in March were only about 37,000 tons, against about 41,000 tons in February.

Railroad Purchases Small

AS shown in the fourth chart, railroad equipment orders have tapered off much as in each of the last two years, and in March were the lowest for the season found in recent years. Locomotive orders were particularly small. Domestic steam locomotive orders as reported by *Railway Age* were only 15, against 30 in February and 70 a year ago. Total foreign and domestic shipments of steam and electric locomotives numbered 70, but unfilled orders declined to only 178, which compares with 392 last year and 780 in 1926. Only 4470 freight car orders were reported, against 5896 in February and 5253 a year ago. With freight traffic failing to gain in March and a rather large surplus of freight cars reported by the railroads, the outlook for nearby equipment business is hardly fair.

European Markets Less Active

Britain Quiet During Easter Holidays—Belgian Mills Seek Orders—French Home Demand Good

(*By Cable*)

LONDON, ENGLAND, April 10.

PIG iron is quiet after the Easter holidays, but Cleveland makers are well sold and foundry and forge iron prices are strong. Hematite iron is dull and prices are maintained with difficulty. Foreign ore is quiet.

Finished steel is inactive, but domestic consumers are busy with existing contracts. Export demand for plates and shapes is still poor.

Tin plate was active up to the holiday period, and with mills in a strong position consumers have bought freely and makers are well sold on the basis of restricted output. Galvanized sheets are quiet and prices have an easy tendency. Black sheets are inactive.

Continental iron and steel is quiet and but little revival is anticipated until prices are more stable. The pig iron entente is maintaining prices at too high a level to permit of sales to the United Kingdom.

The European Rail Makers' Association has increased extras on Siemens-Martin rails by 2s. 6d. (61c.).

FRENCH EXPORTS SMALLER

Domestic Business Active and Semi-Finished Steel Scarce—Pig Iron Prices Firm

PARIS, FRANCE, March 23.—The domestic iron and steel markets continue firm, but there is some weakness in export prices. The German export quota in the International Steel Cartel has been increased for the second quarter by 50,000 tons a month. The quota is now only 25,000, instead of 75,000, tons a month less than the German monthly average of exports in the second half of 1926. Apparently, in agreeing to this increase in German export tonnage, the French members believed that the present activity in the French domestic market would make up for any export losses to the French mills.

Export business has slackened, and buyers are evidently awaiting lower prices. Steel mills, however, are in most cases well booked with business. There is a scarcity of semi-finished material, and this may be one of the reasons Germany was permitted a higher export quota for this quarter. Exports have been smaller this year than in 1927. In January, shipments of ingots, blooms, billets and bars totaled 208,950 tons, compared with 233,445 tons in January, 1927.

Pig Iron.—At its March 15 meeting, the pig iron entente allotted 38,000 tons of phosphoric foundry and 35,000 tons of hematite to the domestic market for April. Previous domestic prices are being maintained, except on hematite iron delivered in the Ardennes, which has been reduced to 562.50 fr. ($17.10) per metric ton. An increase in export prices is expected, but the market is still unchanged at £3 2s. to £3 3s. ($15.10 to $15.34) per metric ton, f.o.b. Antwerp, for foundry iron and basic is quoted at £2 18s. to £2 18s. 6d. ($14.13 to $14.25) per ton.

Semi-Finished Material.—With little material available for prompt delivery, the selling syndicate has advanced semi-finished material and beams 20 to 30 fr. (79c. to $1.18) per ton, effective March 15. The new prices for the domestic market are: Ingots, 470 fr. ($18.47) per ton, instead of 450 fr. ($17.69); blooms, 535 fr. ($21.03) instead of 510 fr. ($20.04); billets, 565 fr. ($22.20) instead of 540 fr. ($21.22); and sheet bars, 600 fr. ($23.58) instead of 570 fr. ($22.40). Mills, in most cases, are booked for the next 90 days, and extended deliveries are offered. Basic Bessemer steel is particularly scarce, and some mills are resorting to open-hearth steel.

Finished Material.—Beams have been advanced 30 fr. ($1.18) per ton to 650 fr. ($25.55), f.o.b. works. For export, normal specifications range from £4 13s. 6d. to £4 14s. per ton (1.03c. to 1.04c. per lb.). Angles are quoted at £5 1s. 6d. to £5 2s. per ton (1.12c. to 1.13c. per lb.), f.o.b. Antwerp. There is a good volume of business in sheets, and on medium and heavy gages prices are firm. Quotations on light-gage sheets show some unsteadiness. On 1/16-in. black sheets, export prices

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British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:

Durham coke, del'd.	£0	18s.				$4.39		
Bilbao Rubio ore*	1	2½				5.48		
Cleveland No. 1 fdy.	3	8½				16.56		
Cleveland No. 3 fdy.	3	6				16.07		
Cleveland No. 4 fdy.	3	5				15.83		
Cleveland No. 4 forge	3	4½				15.71		
Cleveland basic (nom.)	3	15	to £3	15½s.		18.27	to	$18.39
East Coast mixed	3	10				17.05		
East Coast hematite	3	10½				17.17		
Rails, 60 lb. and up.	7	15	to	8	0	37.75	to	38.96
Billets	6	0	to	6	10	29.22	to	31.66
Ferromanganese	13	10				65.75		
Ferromanganese (export)	13	0	to	13	5	63.31	to	64.53
Sheet and tin plate bars, Welsh	5	7½	to	5	15	26.18	to	28.01
Tin plate, base box.	0	18	to	0	18¼	4.39	to	4.45
Black sheets, Japanese specifications.	13	5	to	13	10	64.53	to	65.75
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.66	to	1.77
Boiler plates	9	2½	to	9	12½	1.98	to	2.09
Tees	8	2½	to	8	12½	1.77	to	1.99
Channels	7	7½	to	7	17½	1.60	to	1.71
Beams	7	2½	to	7	12½	1.55	to	1.66
Round bars, ¾ to 3 in.	7	5	to	7	15	1.58	to	1.69
Steel hoops	10	10	to	11	0	2.28	to	2.39
Black sheets, 24 gage	10	0	to	10	5	2.17	to	2.23
Galv. sheets, 24 gage	13	2½				2.85		
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.04	to	3.10

*Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)			
Belgium	£3	3s.	$15.34
France	3	3	15.34
Luxemburg	3	3	15.34
Basic pig iron (nom.):			
Belgium	3	0	14.61
France	3	0	14.61
Luxemburg	3	0	14.61
Coke	0	18	4.39
Billets:			
Belgium	4	13	22.65
France	4	13	22.65
			C. per Lb.
Merchant bars:			
Belgium	5	4	1.15
France	5	4	1.15
Luxemburg	5	4	1.15
Joists (beams):			
Belgium	4	14½	1.04
France	4	14½	1.04
Luxemburg	4	14½	1.04
Angles:			
Belgium	5	5	1.16
⅛-in. plate:			
Belgium (a)	6	9	1.42
Germany (a)	6	9	1.42
¼-in. ship plates:			
Belgium	6	5	1.33
Luxemburg	6	5	1.33
Sheets, heavy:			
Belgium	6	1	1.34
Germany	6	1	1.34

(a) Nominal.

range from £6 15s. to £6 15s. 6d. per ton (1.49c. to 1.50c. per lb.), and for 0.5 mm. the market is £10 10s. to £10 12s. 6d. per ton (2.32c. to 2.34c. per lb.), f.o.b. Antwerp. Exports of sheets in January totaled 28,466 metric tons, compared with 29,103 tons in January, 1927. Negotiations for the establishment of a sheet syndicate are being continued, and about the only obstacle to success seems to be selection of the proper person to head such a cartel.

STEEL CARTEL UNSATISFACTORY

Formation of Selling Syndicates Still Urged—Polish Membership Unsettled

(*Special Correspondence*)

BERLIN, GERMANY, March 24.—Recent reports, apparently from Paris, to the effect that French members of the International Steel Cartel are dissatisfied with its operation and wish to have it dissolved are not given much credence. In the past year and a half of the existence of the cartel, France has not exceeded the quota in any quarter and has received large refunds from the quarterly distribution. In addition, the French mills have been endeavoring to further the interests of the cartel by better internal organization. Lately, however, the trade press in France has been suggesting that French steel, as a result of increasing German competition, may be excluded from many foreign markets.

The cartel is undoubtedly in an unsatisfactory position. No solution has yet been found for the two principal problems that have faced the cartel since its formation. One is the entry of Poland with a quota satisfactory both to the Polish mills and other cartel members; the other is organization of international selling syndicates for different products.

At the recent cartel meeting in Paris it was agreed that Poland might have full protection in the Polish domestic market, but 300,000 tons per quarter was the maximum export quota offered, while Polish mills demanded 350,000 tons with a proviso that it was to be increased by 1 ton for every increase of 3 tons in domestic consumption. Membership was also made contingent upon Poland's reaching an agreement with Germany and the Central European members on exports to the Near East and on Polish membership in the European Rail Makers' Association.

It seems to be generally agreed that the steel cartel cannot become fully effective until the selling syndicates to control prices have been established. Now that the French have formed an entente to control sales of beams and semi-finished material, German mills contend that Belgium is the sole obstacle to this change. It is argued that Belgium sells for export at any price with the chief object of maintaining full works operations. This forces Germany to quote unprofitable export prices, at the same time maintaining a high rate of operation so as to reduce costs. As a result, penalties for overproduction must be paid each quarter.

The belief prevails in Germany that establishment of selling syndicates would aid in the maintenance of prices at a profitable level and, in addition, German domestic and export prices would show much less difference, which would eliminate the agitation against the German Steel Syndicate for maintaining such a high domestic market.

Belgian and Luxemburg Exports Smaller in January

WASHINGTON, April 9.—While the export trade of the combined Belgian and Luxemburg iron and steel industries in January was much smaller than in January of last year, it represented a considerable improvement over the total for December, according to a report received by the Department of Commerce from the commercial attaché in Brussels. The export trade of the month totaled 290,987 metric tons, compared with 346,466 tons in January, 1927. This tonnage consisted principally of billets and sheet bars, 51,646 tons, and sheets, 31,580 tons. Other large exports were structural shapes, hot-drawn rods and wire, blooms and scrap. The month's import trade aggregated 68,743 tons, compared with 50,907 tons in the same month of last year.

BELGIAN PRICES WEAKER

Mills Seeking More Tonnage Offer Concessions —Output Slightly Smaller

ANTWERP, BELGIUM, March 24.—Except for a moderate demand for beams and some semi-finished products, business is light. As a result, the market shows a slight tendency toward weakness, and, if desirable tonnages were offered, lower price levels would probably develop. Production apparently exceeds consumption, and delays in deliveries are growing shorter. Buyers are pressing for lower prices, and exporters are selling at less than the mills are now willing to accept in the belief that they will soon be able to purchase profitably. Makers, however, are resisting the pressure for lower prices, and concessions are not common.

Pig Iron.—Demand continues good, and prices are firm. Quotations on No. 3 phosphoric foundry iron are unchanged at $16.25 per metric ton, f.o.b. furnace, in the domestic market and at £3 3s. ($15.50) per ton, f.o.b. Antwerp, for export. Bessemer hematite is quoted at about $18 per ton at the furnace.

Semi-Finished Material.—Except for slabs, business has been small and some concessions in price have been made. Quotations are £4 3s. to £4 7s. ($20.35 to $21.30) per metric ton, f.o.b. Antwerp, on blooms and £4 9s. to £4 12s. 6d. ($21.80 to $22.70) per ton on billets. Sheet bars are about £4 14s. ($23) per ton, f.o.b. Antwerp.

Finished Material.—The tendency of the market seems to be downward, with only a small tonnage of transactions reported. A number of mills are seeking business and show willingness to make concessions. As a result, buyers are limiting their purchases in expectation of still lower prices. There seems to be a limit, however, to the concessions sellers are willing to offer. Steel bars are quoted at about £5 6s. per ton (1.17c. per lb.), but German exporters are reported to be offering bars at £5 5s. (1.16c. per lb.). Demand in general is smaller than a few weeks ago, and output has been curtailed somewhat. Beams are fairly firm as a result of better demand, so that prices are holding at about £4 15s. per ton (1.05c. per lb.). Hoop prices show some weakness, as production is still at a high level and demand is small. Hoops are quoted at about £6 per metric ton (1.32c. per lb.), f.o.b. Antwerp.

German Exports Larger and Imports Smaller in February

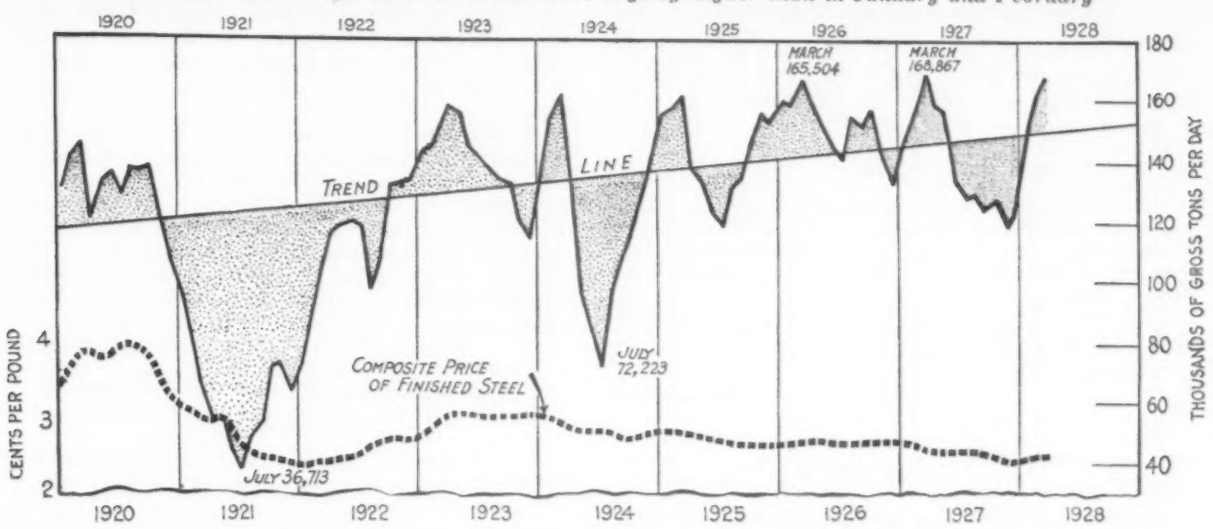
WASHINGTON, April 7.—Exports of iron and steel products from Germany increased to 350,924 metric tons in February, compared with 314,839 tons in January, a gain of 36,085 tons. Imports in February declined to 181,656 tons, compared with 202,469, a decrease of 20,813 tons, according to a radiogram received by the Department of Commerce from the commercial attaché at Berlin. In December there were increases in both exports and imports.

The principal increases in February exports were in rails, totaling 49,953 tons, compared with 33,611 tons in January; plain wire, 35,013 tons, compared with 21,959 tons in January; ingots and semi-finished steel, 39,602 tons, compared with 29,176 tons in January; jig iron and ferroalloys, 21,579 tons, compared with 13,879 tons; and cast iron pipe, 8750 tons, compared with 4215 tons. There was a reduction of 6878 tons in exports of castings and forgings, and a decline of 11,723 tons in exports of iron and steel bars, which totaled 71,922 tons in February, compared with 82,645 tons in January.

In the import movement 14 of 20 items showed reductions, the largest being a decrease of 8667 tons in ingots and semi-finished steel, which totaled 25,367 tons in February and 34,034 tons in January. Other notable reductions included rails and iron and steel bars. The principal tonnages in the February imports were in iron and steel bars and rods, ingots, pig iron and ferroalloys, hoops and bands and plain wire.

The Bratislava Cable Co., Bratislava, Czechoslovakia, has announced that it plans to erect approximately 300 steel dwellings near that city, according to a report from Vice-Consul Frank P. S. Glassey, Prague.

With the Largest Quarter's Ingot Production Ever Recorded, the March Tonnage Fell Less Than 1 Per Cent Below Last Year's High Record. Prices were slightly higher than in January and February



Ingot Production Makes New Record

First Quarter Well Ahead of Best Preceding Quarter—March Slightly Lower Than Last Year

PRODUCTION of open-hearth and Bessemer steel ingots in the United States in March is calculated by the American Iron and Steel Institute at 4,507,520 gross tons. This is based on returns from companies which, in 1927, produced 94.68 per cent of the total. Except for March, 1927, it represents the largest month's output in the history of the industry. It compares with a revised figure of 4,045,304 tons in February and with 4,535,272 tons in March, 1927.

With 27 working days, the estimated output was 166,945 tons a day, the fifth month which has ever exceeded 160,000 tons a day. This compares with 161,812 tons a day in the preceding month and with 167,973 tons in March, 1927. The original estimate for March, 1927, in which crucible and electric steel ingots were included, was 168,867 tons a day, as shown on the diagram.

For the first quarter of the year the calculated output was 12,544,156 tons. This compares with 12,137,192 tons in the first quarter of 1927, which had one day less in February. It compares also with 12,385,878 tons in the first quarter of 1926—the previous high record—in which total the electric and crucible ingots were included. If we estimate roughly that these represented 100,000 tons for the quarter, it follows that the quarter just elapsed was nearly 260,000 tons greater in output than the previous first quarter record. Only one other first quarter, that of 1925 with 12,139,000 tons, had an output of over 12,000,000 tons.

Both open-hearth and Bessemer tonnage improved in March, compared with February, open-hearth tonnage going up 12 per cent and Bessemer tonnage 9 per cent. For the first quarter, open-hearth output showed a gain of 500,000 tons over the first quarter of 1927, this representing more than 5 per cent. Meantime, Bessemer tonnage declined 114,000 tons, or nearly 7 per cent, leaving a calculated total gain of 407,000 tons, or about 3.4 per cent.

Estimating production in March of electric and crucible steel ingots (no longer covered in the institute's monthly figures) at 1200 tons a day, the total March ingot output would appear to have been at the rate of about 168,100 tons for each working day. Details of the past 15 months are shown in the table.

Production of Steel Ingots*

(Gross Tons)

Months 1928	Reported by Companies Which Made 94.68 Per Cent of the Steel Ingots in 1927 — Open-Hearth	Bessemer	Calculated Monthly Production All Companies	Approximate Daily Production All Companies
Jan.	3,280,247	498,746	3,991,332	153,513
Feb.	3,308,728	521,366	4,045,304	161,812
March ..	3,700,411	567,309	4,507,520	166,945
3 Months	10,289,386	1,587,421	12,544,156	160,823
1927				
Jan.	3,042,133	545,596	3,789,874	145,764
Feb.	3,043,492	565,226	3,812,046	158,835
March ..	3,702,660	590,709	4,535,272	167,973
3 Months	9,788,285	1,701,531	12,137,192	157,626
April ...	3,341,750	565,440	4,127,335	158,744
May	3,273,593	557,785	4,047,251	155,663
June ...	2,823,107	486,053	3,495,609	134,446
July	2,596,349	436,883	3,204,135	128,165
Aug. ...	2,806,347	505,596	3,498,549	129,576
Sept. ...	2,622,977	471,548	3,268,881	125,726
Oct.	2,643,562	495,845	3,316,292	127,550
Nov. ...	2,478,627	481,599	3,127,015	120,270
Dec.	2,557,955	448,154	3,175,484	122,134
Total..	34,932,552	6,150,434	43,397,743	139,543

*Excluding crucible and electric steel ingots.

Smaller Production of Magnesite

Production of crude magnesite in the United States in 1927 is reported by the Bureau of Mines at 121,490 net tons, a drop of 12,000 tons from the 1926 total of 133,500 tons. Imports dropped also, from 196,318 tons in 1926 to 149,126 tons in 1927. As a result, the total available supply of the year at 270,616 tons showed a decided shrinkage from the supply of 1926, which was 329,818 tons, the largest total for some years.

Application of safeguards and other safety devices has enabled the Fulton Co., 732 Seventy-fifth Avenue, West Allis, Wis., to operate 580 days without an accident. The company manufactures automotive accessories and operates sixteen punch presses and other machinery rated as high risks. Its average payroll numbers 47 men.

Technical Program for British Steel Institute's Annual Meeting

For the annual meeting of the Iron and Steel Institute in London, May 3 and 4, the following technical papers have been scheduled for presentation:

Second Report on Heterogeneity of Steel Ingots, by a committee of the institute.

"Blast Furnace Data and their Correlation," by E. C. Evans and F. J. Bailey.

"The Influence of Nickel in Iron-Carbon-Silicon Alloys containing Phosphorus," by A. B. Everest and D. Hanson.

"A Study of the Resistance of Over-Stressed Wrought Irons and Carbon Steels to Salt Water Corrosion," by J. Newton Friend.

"A Comparison of the Most Important Methods Employed in the Cleaning of Blast Furnace Gas," by V. Harbord.

"Heat-Resisting Steels. Part II.—Mechanical Properties," by W. H. Hatfield.

"Blast Furnace Practice in Natal," by J. E. Holgate and R. R. F. Walton.

"The Properties of Nickel Steels with Special Reference to the Influence of Manganese," by J. A. Jones.

"Reactivity of Coke," by J. H. Jones, J. G. King and F. S. Sinnatt.

"The Recovery and Sinking-in or Piling-up of the Material in the Brinell Test and the Effects of these Factors on the Correlation of the Brinell with certain other Hardness Tests," by A. L. Norbury and T. Samuel.

"Twin-like Crystals in Annealed Alpha Iron," by H. O'Neill.

"The Effect of Silicon on Tungsten Magnet Steel," by J. Swan.

"Chromium Steel Rails," by T. Swinden and P. H. Johnson.

"The Fatigue Resisting Properties of 0.17 per cent Carbon Steel at Different Temperatures and at Different Mean Tensile Stresses," by H. J. Tapsell.

"The New Plant of the Appleby Iron Co., Ltd.," by T. Thomson.

"On the Structure of the Iron-Chromium-Carbon System," by A. Westgren, G. Phragmén and Tr. Negresco.

"The Rapid Normalizing of Overstrained Steel," by W. E. Woodward.

At the first session on May 3, Benjamin Talbot will be inducted into office as the new president and Charles M. Schwab, chairman of the board, Bethlehem Steel Corporation and president American Iron and Steel Institute, will be presented with the Bessemer Gold Medal.

Arrangements are being made to hold the autumn meeting at Bilbao, Spain, Sept. 25 to 27.

To Discuss Mechanization of Coal Mines

Mechanization of coal mines will be discussed at a meeting in Columbus, Ohio, April 21, under the auspices of the American Institute of Mining and Metallurgical Engineers, the National Coal Association, the American Society of Mechanical Engineers and the Southern Ohio Pig Iron and Coke Association. The program is under the supervision of Ralph H. Sweetser, American Rolling Mill Co., Columbus, and will consist of an inspection trip in the morning, a noon luncheon, an afternoon session at Ohio State University and dinner at the Faculty Club of the university.

A similar meeting under the same auspices will be held at Philadelphia on April 24 at which mechanization relating particularly to the mining of anthracite coal will be considered.

Testing Society to Study Use of Specifications in Market Quotations

As an outcome of a recommendation made by committee B-2 on non-ferrous metals and alloys of the American Society for Testing Materials, the executive committee has authorized the appointment of a special committee of the society "to study and promote the use of specifications covering copper alloys (in ingot form) as the basis of price quotations in the technical and trade journals." It is believed that the usefulness of A.S.T.M. specifications in all fields would be enhanced if they were more generally made the basis of market quotations and purchases. At the same time it is felt that efforts in this direction should for the present be confined to copper alloys in ingot form, where there apparently is particular need for greater definiteness in price quotations, and that it be extended into other fields only after some experience has been gained in this method of promoting the use of A.S.T.M. specifications.

Past-President Guilliam H. Clamer has accepted an invitation to become chairman of the proposed committee, which will consist of five producers of copper alloys, five consumers, and five representatives of technical and trade journals. Considerable interest has been shown by representatives of all three groups in the possibilities of this work, and it is planned if possible to organize the committee before the next annual meeting of the society.

Exhibit to Show Possibilities of Castings

As one means of assisting in the education of foundrymen to realize the possibilities of castings for engineering purposes, the American Foundrymen's Association is to sponsor a special exhibit at the Philadelphia convention May 14 to 18, showing examples of castings having the highest standards in engineering properties. Some of the possibilities of properties which it desires to emphasize are:

Strength
Machinability
Uniformity of grain structure
Hardness for special purposes
Corrosion resistance
Resistance to abrasion
Surface appearance of finish
Electrical

The exhibit of steel castings is being organized under the direction of the Steel Founders' Society of America; secretary W. J. Corbett, 511 Magee Building, Pittsburgh. The exhibit of malleable castings is being organized under the direction of the Malleable Iron Research Institute; secretary Robert E. Belt, Union Trust Building, Cleveland. The exhibit of gray iron castings is being organized under the direction of a committee of gray iron foundrymen; D. M. Avey, chairman, Penton Building, Cleveland. The exhibit of non-ferrous castings will be sponsored by a committee organized under the direction of W. M. Corse, secretary institute of metals division, A.I.M.M.E., 810 Eighteenth Street, Washington.

Any foundry organization making castings with exceptional values of the above properties, or of other engineering qualities, is invited to correspond with the committees mentioned above or with the secretary of the American Foundrymen's Association.

Foundrymen to Hold Apprentice Contests

The committee on apprentice contests of the American Foundrymen's Association, at a recent meeting, outlined rules and regulations to govern the annual national apprentice molding and pattern making contests, which will be held in connection with the 1928 meeting of the association at Philadelphia, May 14 to 18.

As in the past, local foundry associations and individual plants have been asked to cooperate by holding elimination contests, sending to the Philadelphia meeting the winning patterns and castings of the local contests. The entries sent to Philadelphia will be judged by a committee appointed by the association and prizes awarded to the makers of the best patterns and castings. The awards committee has set aside a sum of money to be used as prizes, which shall consist of a wrist watch, value $50, as first prize; of $25 as second prize and $10 as third prize for pattern making, iron molding and steel molding.

A bibliography on mechanical springs has been prepared by a research committee of the American Society of Mechanical Engineers. It covers some 600 references, which are indexed both by authors and chronologically, and a subject index is included.

NEW RAILROAD FAVORED

Line from Youngstown to Ohio River Approved by Shippers in Reply to Commerce Commission

WASHINGTON, April 10.—Reply was made public last Saturday by the Interstate Commerce Commission of its questionnaire regarding the proposed new line of the Pittsburgh, Lisbon & Western Railroad, controlled by the Montour Railroad, the latter's capital stock being owned by the Pittsburgh Coal Co. It is proposed to construct approximately 40 miles of new railroad. The existing line of the Pittsburgh, Lisbon & Western would be utilized in conjunction with the new construction to afford a through line from the Youngstown iron and steel manufacturing district to the Ohio River near Smiths Ferry, Pa., which is on the outskirts of East Liverpool, Ohio. About 13 miles would be constructed south of the present Lisbon line and 23 miles north of the present Lisbon line, and in conjunction with the 23-mile construction to Youngstown there would be a branch of about five miles to Struthers, Ohio, if the commission approves the project.

The answer to the questionnaire says that the traffic from Smiths Ferry is expected to be principally bituminous coal. The traffic from Youngstown to the Ohio River is expected to be principally iron and steel products. The shipment of bituminous coal from Smiths Ferry to Youngstown and beyond, the reply says, would be entirely ex-river coal. In its proposed location the line would be a north and south railroad, traversing Mahoning and Columbiana counties in Ohio and Beaver county, Pennsylvania, with a population of substantially 500,000 people. At Youngstown this carrier would provide a belt line on the west and south sides of the city, opening up an entirely new territory for manufacturing development.

The reply says that the proposal is expected to meet with substantial approval and support of the industries concerned in the utilization of the Ohio River waterway, which has been intensively developed for transportation purposes by the United States Government through the expenditure of large sums of money and in accordance with a policy of many years standing. The belief is expressed that the additional facilities would be well patronized by shippers of the Youngstown industrial district and by coal shippers along the canalized Ohio and tributary rivers. It is expected to haul 1,334,000 tons of coal the first year, 1,500,000 tons the second year, 1,667,000 tons the third year, 1,830,000 tons the fourth year, and 2,000,000 tons the fifth year at an averate rate of 60c. per ton for an average haul of 40 miles. The answer does not make an estimate of the steel tonnage it is expected to carry from the Youngstown district.

"The market for Youngstown's iron and steel in the South is now considerably hampered and restricted because of the necessity of shipment by rail lines, whereas the competitors of Youngstown are able to ship via river routes for all or a large part of the distance to destination at considerably less transportation cost," says the reply. "It is expected that the construction and operation of the proposed line will permit the shipment of Youngstown iron and steel products to the South with the necessity of but 40 miles of rail transportation, enabling the Youngstown iron and steel manufacturer to utilize beyond Smiths Ferry the cheaper river transportation which will then be available to him.

"Under such circumstances, it is expected that new business will be developed in the Youngstown district by the construction of the proposed new lines and the tonnage of iron and steel articles from Youngstown over the proposed new line will, therefore, be created business and will not be business diverted from existing railroads."

Construction of the new line would be begun promptly after the issue of the necessary authority of the commission, the answer says, and it is expected that the entire work would be completed within two years from the date authority is issued. The rails of the line would be 115 lb. per yd.

Department of Commerce Bulletin on French Machinery Industry

WASHINGTON, April 10.—The value of machinery made in France in 1926 is estimated at $130,000,000, which is three times that of 1913 figured on a gold basis, according to a report prepared by Assistant Trade Commissioner F. P. Waller, which has just been issued by the Industrial Machinery Division, Department of Commerce. In the case of machine tools, the value in 1926 was four times that of the pre-war year. The bulletin says the French machinery industry has advanced over its pre-war position largely because of four factors: (1) the country's increased capacity for iron and steel production resulting from the acquisition of Alsace-Lorraine, (2) the growth of French industries in general, (3) the depreciating exchange value of the franc, and (4) low labor costs.

The progress of the machinery industry in France, the bulletin points out, is strikingly reflected in its foreign trade. In 1926, imports on a quantity basis were 43 per cent less than in 1913, while exports had risen 268 per cent. Comparing the value of imports for the two periods, 1926 showed a drop from $35,000,000 in the pre-war year to less than $31,000,000 in 1926. French machinery exports in 1926 had a value of more than $20,000,000, compared with less than $7,000,000 in 1913. In 1927, the same favorable trend continued, the quantity of imports decreasing more than 18 per cent compared with 1926 and the quantity of exports rising 7 per cent.

Prior to the war, the bulletin says, Germany was by far France's most important supplier of industrial machinery, its share amounting to more than 46 per cent of total French imports in 1913. In that year the share of the United States was something under 6 per cent, total imports of American machinery being valued at around $3,000,000. In 1926, the value of French machinery imports from the United States had risen to $6,450,000 and its ratio of total imports to 18.4 per cent. During that year imports of German machinery into France had a value of $8,000,000, about 24 per cent of the total imports. The three chief suppliers of the French market in the order named were Germany, Great Britain and the United States. The bulletin points out as an interesting fact that while during the past few years the quantity of machinery imports from the United States has declined the value has risen, proving that French consumers are buying more special and high-class American machinery. Mr. Waller expresses the view that this trend will continue. While he states that the French are expanding their own machinery industry and furnishing the domestic market with increasing quantities of ordinary types of machines, the demand will grow for American high-production equipment, such as cannot be obtained from home manufacturers.

The publication is known as Trade Information Bulletin No. 543, "French Market for Industrial Machinery," and may be obtained for 10c. from any of district offices of the Department of Commerce, or from the Superintendent of Documents, Government Printing Office, Washington.

The Mystic Iron Works operated at full capacity throughout the year, says the 1927 report of the Massachusetts Gas Co., Boston. The designed capacity of the stack is 150,000 gross tons, and production was 175,244 gross tons. Notwithstanding unfavorable market conditions for pig iron, shipments totaled 74 per cent of furnace output. The New England Coal & Coke Co. produced 673,110 gross tons of fuel, contrasted with 534,450 in 1926. The Mystic Iron Works was furnished with 143,000 tons of coke. The battery of 55 Wilputte ovens, put in operation in December, 1926, ran throughout 1927, and 100 of the Otto Hoffman ovens were shut down permanently in April, 1927.

FLUORSPAR TONNAGE OFF

Drop of 13 Per Cent in 1927—Open-Hearth Furnaces Used Seven-Ninths of Total

WASHINGTON, April 7.—Showing a decline of 13 per cent both in quantity and value, fluorspar shipments from mines in the United States decreased to 112,546 net tons, valued at $2,034,728, in 1927, against 128,657 tons in 1926, according to a report issued by the Bureau of Mines. Shipments were made from Colorado, Illinois, Kentucky and New Mexico last year, with the last-named State the only one to record an increase.

Shipments to steel plants last year totaled 93,196 tons, valued at $1,523,915, an average of $16.35 a ton, f.o.b. shipping points. This compares with 105,614 tons, valued at $1,744,085, in 1926, an average of $16.51 a ton. Shipments to foundries amounted to 4533 tons, valued at $84,724, in 1927, an average of $18.69, compared with 6212 tons, valued at $121,453, in 1926, an average of $19.55. The general average value shipped to steel plants in 1927 from the Illinois-Kentucky district was $16.59 a ton and from the Colorado-New Mexico district $13.72 a ton. These values compare with $16.98 for the Illinois-Kentucky district and $12.69 for the Colorado district in 1926.

Total shipments from Kentucky mines in 1927 amounted to 57,495 tons, valued at $1,040,338, an average of $18.09, while shipments from Illinois mines totaled 46,006 tons, valued at $863,909, an average of $18.78. Shipments from Kentucky mines in 1926 amounted to 62,494 tons, valued at $1,167,129, an average value of $18.69, while shipments from Illinois mines that year aggregated 53,734 tons, valued at $1,012,879, an average value of $18.85.

According to reports of producers, the stocks of fluorspar at mines or at shipping points on Dec. 31, 1927, amounted to 21,208 tons of gravel spar, 1857 tons of lump and 385 tons of ground spar. In addition, there was in stock piles at the mines at the close of 1927 about 49,000 tons of crude spar, equivalent to about 29,000 tons of merchantable material. These stocks compare with 20,731 tons of "ready-to-ship" spar and 48,266 tons of crude spar on Dec. 31, 1926, making an increase of about 13 per cent in the stocks of merchantable spar and 2 per cent in crude spar over 1926.

Total imports in 1927 were 71,515 tons, a decrease of 5 per cent from the record year 1926, but the second largest ever recorded. The imports last year were equivalent to 64 per cent of the total shipments of domestic fluorspar and compared with 59 per cent in 1926. The United Kingdom, which has been the chief source of the imported fluorspar, supplied only 26 per cent in 1927, the 18,449 tons coming from that country showing a decrease of 37 per cent from 29,407 tons in 1926. Germany was the chief source of imports in 1927, supplying 31,829 tons, or 45 per cent of the total, and comparing with 20,465 tons in 1926.

The basic open-hearth furnaces, the largest users of fluorspar, consumed 138,000 tons in 1927 and had 85,000 tons in stock at the end of the year, as compared with 142,000 tons consumed and 70,000 tons in stock in 1926. Electric furnaces consumed 4700 tons and had 1200 tons in stock last year, against 4800 tons and 2000 tons respectively in 1926. Foundries consumed 3400 tons and had 1000 tons in stock in 1927, against 4335 tons and 1400 tons respectively in 1926. Other industries, combined, used 30,100 tons in 1927. The figures for the basic open-hearth furnaces include data for the 72 companies that make 99 per cent of the total basic open-hearth steel, and estimates for the other three companies.

Slight Recovery in Locomotive Shipments in March

WASHINGTON, April 7.—Seventy railroad locomotives were shipped from the principal manufacturing plants in March, against 59 in February and 137 in March of last year, according to reports received by the Department of Commerce. Of the March shipments 59 were for domestic use, 44 being steam and 15 electric locomotives. Of the 11 locomotives exported nine were steam and two electric. Unfilled orders at the end of March totaled 178 locomotives, of which 160 were for domestic use, 123 being steam and 37 electric. Foreign orders totaled 18 locomotives, 16 being steam and two electric.

Automotive Business Continues at a High Rate

Automotive Industries this week will say:

"Continuance of automotive business on an even keel is indicated for the second quarter of 1928, now two weeks gone. National Automobile Chamber of Commerce members during the first quarter went ahead of the same period in 1927 both in sales and in production, but the total number of passenger cars delivered at retail by the industry, including Ford, appears to have been slightly less during the first three months of this year than during the first three of last. Total passenger car production, however, including that of Ford, was nearly 5 per cent ahead of last year's first quarter.

"As a whole, there can be no question that 1928 is going along better than did 1927, and that the second quarter will continue to show similar favorable aspects. Ford is gradually getting into larger and larger production, as is generally known, but had not reached a sufficiently large volume at the end of March to come anywhere near meeting the accumulated or even the current demand for his products. Consequently, a better picture of the general progress of the industry is available for the moment from a consideration of performance of National Automobile Chamber of Commerce members, with Ford excluded, than from discussion of total 1928 figures as compared to 1927 totals.

"On this basis the sound foundation on which current optimism is based is revealed by the fact that first quarter passenger car production this year exceeded that of last by something like 26 per cent, while truck output for the same period was 19 per cent in excess of last year's first three months. Exact sales figures are not available, but partial data indicate that retail deliveries of cars built by National Automobile Chamber of Commerce members were somewhere between 15 and 20 per cent ahead of last year for the first quarter."

Increasing Shipments of Sheet-Metal Ware Reported

February shipments of galvanized sheet-metal ware, as reported to the Department of Commerce by 15 concerns comprising a large proportion of the industry, were 188,487 dozens, valued at $727,257, as compared with 184,993 dozens in January, valued at $691,348, and 201,830 dozens, valued at $735,878, in February of last year.

February shipments of enameled sheet-metal ware, as reported by 18 manufacturers comprising approximately 80 per cent of the industry, were 372,885 dozens, valued at $1,457,425, as compared with 319,871 dozens, valued at $1,093,329, in January, and 372,452 dozens, valued at $1,335,312, in February, 1927.

Wheeling Steel Corporation to Blow in a Riverside Furnace

The Wheeling Steel Corporation will soon blow in No. 2 blast furnace at Benwood, W. Va., the larger and more modern of the two furnaces acquired in its purchase of the Riverside Works, National Tube Co. One of the Steubenville furnaces is going out this week for relining.

Hot Blast, Powdered Coal in Cupolas

Phases of the Recent Advance of Science in the Foundry Considered at Ann Arbor Meeting—Sand Testing More Highly Developed

SOME present day foundry problems and recent developments in the industry, including the use of powdered coal for cupolas, also hot-blast cupolas and the testing of foundry sands, were discussed at a meeting of the Ann Arbor Division, Detroit Chapter of the American Society for Steel Treating, held April 3 in the East Engineering Building, Ann Arbor. The general subject of discussion was foundry control. Prof. William P. Wood of the University of Michigan was chairman of the meeting. Three speakers were on the program and general discussion followed their talks, which were of much interest.

"The greatest competition in industries is bound to come from new methods," declared Prof. A. E. White, director of engineering research, University of Michigan, who was called on to close the discussions. "The only way to meet conditions as they develop is to keep on your toes and bring out the best product that it is possible to produce."

Rapid Changes Affecting Steel Foundries

Doctor White pointed out that industries are in a state of transition due to the adoption of new methods. Rigid restrictions on steel castings have been proposed by the National Electric Light Association. Steel castings, he said, are facing competition with forge shops and with plants developing the manufacture of steel tubing in large diameters. Germany is now making steel tubing up to 24 in. in diameter and one mill has been erected in this country to make tubing of the same size. While visiting the plant of the A. O. Smith Corporation in Milwaukee recently he saw pipe 15 ft. in diameter with 2-in. wall thickness welded so perfectly that when broken none of the ruptures occurred in the electric welds. Steel foundries, he said, are facing the competition of fabricated parts made from forgings and by the use of the welding process. Automobile cylinder blocks in the future may be forgings instead of castings. He understood that one automobile company was doing experimental work in this direction at present.

Marked Progress in Sand Testing Devices

Much interest was shown in a discussion of the control of foundry sand by Prof. H. L. Campbell, University of Michigan. He emphasized the importance of testing and checking cores and core sands and declared that much attention is now being given to this part of foundry control. Some of the latest devices for testing foundry sands were shown and their operation described by the speaker.

Professor Campbell declared that great progress has been made in the control of processes in the foundry because of the application of science. Turning to materials used in the making of molds and cores he said that they must have high refractory properties and permeability and must provide a smooth surface to give a good finish on the casting. Foundry sand has certain characteristics that must be watched. Various devices have been developed to check foundry sand. One of the latest instruments is for measuring the green bond strength. The sand is packed in a sleeve and the cylindrical specimen thus made is put in an instrument that, operating under compression, registers the pressure required to break the sand. A machine for testing permeability in green sand mixtures was shown. With this air is forced through the specimen and a register indicates the time and pressure required for forcing a certain amount of air through. Smoothness of sand is tested for fine finish. However, finish of surface is determined largely by experiment.

A Late Method for Measuring Permeability

Dry sand cores have certain very definite requirements, Professor Campbell pointed out. The first is permeability. The entire core should be permeable to allow gases to escape freely. A method was developed recently by which that property can be easily determined. A standard specimen is prepared and placed in a mercury sealed cup. Then two leaders of air are passed through the core under standard pressure and the time required for forcing the given amount of air through the core is recorded.

Another important quality in cores is strength, as this must be enough to resist the buoyancy of the molten metal. Professor Campbell adopted a 1-in. x 1-in. x 8-in. standard core specimen to test strength. The core box is placed on a plate on which the core is made and baked. A hopper is placed on the core box. The formed core is subjected to a ramming action with ten blows. In this way uniform cores are produced. Then they are given a transverse test on a testing machine, the core being supported near the two ends and the load applied at the center.

Standard green sand specimens for testing strength are made in the form of a hemisphere. The specimen is placed under a cone and pointer device and the load falls on the specimen, the force required to fracture it being recorded. The speaker pointed out the necessity of finding the green bond sand strength in weak sand. Various core binders are used to produce green bond strength. He considered raw linseed oil the best core sand binder in use today. Where intricate cores are made, additional materials are used for binders such as flour, cornstarch and molasses.

The various methods of measuring the properties of cores have been developed in research laboratories, according to the speaker, and this core testing apparatus is now being used in about thirty foundries to safeguard their cores. Professor Campbell referred to the cylinder block of the Dodge automobile, which he described as simply an assembly of cores forming a dry sand mold. Research work is being conducted on various types of sand to determine which gives the best finish to castings.

Methods That Have Been Used Effectively in the Wilson Foundry

One factor in foundry operations that is not stressed as much as it should be is the human element, in the opinion of Fred Walls, chief metallurgist of the Wilson Foundry & Machine Co., Pontiac, Mich. While much foundry testing equipment has been developed, he holds that only 10 per cent of the foundry troubles are due to the material element, 90 per cent being on the human side. The technical college graduates that are now going into foundries will find a way of controlling the

human element. The foundry, he said, has been greatly neglected from a techincal standpoint.

Mr. Walls explained the method of chart control of the cupola used in the Wilson foundry. A positive pressure blower is used and a constant stream of air is provided. The pressure, which is shown on a recording chart, indicates whether other conditions in the cupola are constant or varying. He had found this method very satisfactory.

Mr. Walls laid stress on the importance of checking weights of materials going into the cupola The practice at Pontiac is to make a test bar every hour. An analysis of this bar is completed within an hour, and thus a quick change can be made in the cupola mixture.

Fairly accurate cupola control can be secured by using optical pyrometers, declared John Grennan, foundry instructor in Michigan University, who was the last scheduled speaker. He said that thermocouples did not work so well in the foundry as in some other lines of work. He stressed the advantages of large ladles in pouring as an aid to uniformity in the metal.

Experience with Hot Blast and Powdered Coal

There has been little improvement in cupola operation until recently, said Mr. Grennan, and some of this is in the use of old methods that are now made to work. The hot blast has not been worked out until recently. The change to continuous operation and long blast has made the hot blast cupola desirable. The Griffin Wheel Co. has installed hot blast cupolas in practically all of its plants. The temperature of the blast is 400 deg. Fahr. and with the use of the hot blast the coke requirement for a ton of iron has been reduced from 262 to 192 lb.

Another important innovation referred to by Mr. Grennan is the use of powdered coal in the cupola. This has been developed in Germany, with a material cutting down of the carbon monoxide that passes from the stack, this being 12 to 15 per cent in an ordinary cupola operation. The result, he said, had been a 30 per cent saving in fuel cost. In the German powdered coal cupola the fuel is blown into the cupola at high velocity, being introduced through special small tuyeres located 6 in. or 7 in. above the regular cupola tuyeres.

The American Radiator Co. has operated powdered coal cupolas with even better results. The use of powdered coal, the speaker said, may revolutionize cupola practice.

Alloys for High-Strength Castings

In a general discussion following the talks Mr. Walls said that he believed that only the surface has been scratched in alloying cast iron. In his foundry castings containing molybdenum had shown tensile strength of 55,000 lb. per sq. in. and could be machined. The heat treatment properties of cast iron containing molybdenum are good. The corners of the castings do not chill much. In his opinion molybdenum in cast iron offers many possibilities, although one of the disadvantages of this alloy is its high cost.

The superheating of cast iron to increase its strength was a subject that has been discussed considerably, said Professor Campbell. Some authorities recommended the use of a large fore-hearth or ladle where oxides can be removed and the slag separated. The Ford Motor Co. is following this practice in a way in heating iron in a mixer after leaving the cupola.

Mr. Walls remarked that he liked to get iron out of the cupola as hot and as fast as possible. In the Wilson foundry they get iron up to a temperature of 2725 to 2750 deg. Fahr. and have made as much as 254 tons in one run. He declared that they get stronger and better iron with a gas pressure of 20 oz.

Carnegie Steel Co. Opens New Warehouse at Houston, Tex.

The Carnegie Steel Co. has completed and has in operation its new warehouse at Houston, Tex., which is located on the Houston Ship Channel. The site has a total acreage of 97.64 acres, of which 18 acres on the channel are developed for warehouse purposes. The main warehouse comprises eight parallel buildings or bays, totalling 650 ft. by 500 ft., all under one roof. It is of steel construction with galvanized, corrugated steel roof and siding, each bay being equipped with an overhead electric traveling crane. Natural light and ventilation are provided in the design of the building, and modern machinery equipment for cutting and performing other operations has been installed. In auxiliary buildings, located conveniently to the warehouse building are the offices, electric sub-station, store room, sanitary station, hospital room, oil house, engine house and garage. The warehouse is served by approximately 1½ miles of standard gage railroad trackage with connections to the Southern Pacific and Public Belt Railroads.

The engineering features were handled by the engineering department Carnegie Steel Co., Pittsburgh, working in conjunction with the warehouse management. R. J. Cummins was the consulting engineer on dock construction and M. J. Sullivan was the architect on the office and other auxiliary buildings. The warehouse is ideally located to receive shipments either by rail or water, as the Houston Ship Channel will take deep sea craft drawing up to 30 ft. of water, and there are connections to all trunk railroad lines entering Houston.

On the west side of the warehouse is a barge slip dredged to a depth of 10 ft. Over this operate three high speed traveling cranes, arranged to transfer materials from barges directly onto the warehouse floor or into railroad cars. These facilities enable the warehouse to receive consignments direct from the mills by water with one handling. Direct connection with the Southern Pacific lines and, through the Port Terminal Railroad, with all railroads entering Houston permit prompt delivery to all points in the territory served by the railroads. For quick and efficient local deliveries, a fleet of trucks is available.

Conforming to the long established policy of the United States Steel Corporation, relating to safety, sanitation and welfare, an attractive building has been provided so that each individual employee may profit by healthful surroundings. Each man has a locker for his private use, while in adjacent rooms are lavatory, shower baths and sanitary facilities of the most modern type. Immediate medical attention in case of sickness or accident is provided by an emergency hospital, constructed and equipped in the most up-to-date manner.

A well, 800 ft. deep, furnishes an abundant supply of pure drinking water. It is cooled by electrical refrigeration and is distributed by numerous fountains conveniently located throughout all the buildings. Power is supplied by Houston Light & Power Co. through a 12,000-volt transmission line to the substation, which contains three 250-kva. power transformers, three 50-kva. lighting transformers and two 500-kw. motor-generator sets.

Among the firms which did the construction and furnished the equipment are:

American Bridge Co., Pittsburgh—main warehouse, building steelwork, roof, siding, doors and windows.

Cleveland Crane & Engineering Co., Wickliffe, Ohio—main warehouse building cranes.

Brown Hoisting Machine Co., Cleveland—dock crane.

Chicago Bridge & Iron Works Co., Chicago—water tank.

Westinghouse Electric & Mfg. Co., Pittsburgh—electric equipment in sub-station.

Buffalo Scale Co., Buffalo—track scale.

United Engineering & Foundry Co., Pittsburgh—cold saw and tables.

General Motors Corporation, Detroit—trucks.

Clark Tructractor Co., Buchanan, Mich.—Tructractors.

Cyclone Fence Co., Waukegan, Ill.—fence and gates.

Suburban Electric Development Co., Pittsburgh—Frigidaire drinking water coolers.

Steel Transportation Requirements Expected to Be Higher This Quarter

WASHINGTON, April 10.—Iron and steel transportation requirements for the second quarter of the present year are estimated at 479,533 carloads, as against 467,359 carloads for the corresponding period of last year, according to reports received by the car service division of the American Railway Association from the 13 shippers' regional advisory boards throughout the United States. This estimated increase of 2.6 per cent is identical in percentage with the estimated increase of coal and coke loading, which is fixed at 2,545,375 cars, as against 2,481,637 cars during the second quarter of 1927. Requirements for castings, machinery and boilers are estimated at 59,977 cars, a decrease of 1.8 per cent from the 61,102 cars required during the second quarter of last year. Agricultural implements are estimated to require 42,458 cars, as against 38,530 cars, an increase of 10.2 per cent, while requirements for automobiles, trucks and parts are estimated at 312,777 cars, as against 242,566 cars, an increase of 28.9 per cent.

Total transportation requirements for 29 of the principal commodities in the second quarter of the present year are estimated at approximately 9,035,963 cars, an increase of about 323,250 cars, or 3.7 per cent, over the corresponding period of last year. The 10 regional bodies estimating an increase were the Atlantic States, Allegheny, Great Lakes, Northwestern, Central Western, Southeastern, Southwestern, Middle Western and Pacific Northwest boards. Those estimating a decrease were the Ohio Valley, the Trans-Missouri-Kansas and the New England boards. In addition to castings, machinery and boilers, decreased requirements were estimated for hay, straw, alfalfa, cotton, cottonseed and products, and citrus fruits.

Flexible Provision of Tariff Act Sustained

WASHINGTON, April 10.—A decision of the United States Supreme Court yesterday sustaining the constitutionality of the flexible provision of the tariff act is of great interest to the iron and steel industry. The holding means that action taken by the President in changing duties in the metals section under this provision is valid. No appeal, therefore, can be successfully made against changes in rates. The principal change in the duties in the metals section, so far as the iron and steel industry is concerned, relates to the increase of 50 per cent in the rate on pig iron. The decision also means that investigations and reports under way will be completed. Reports regarding changes in duties on fluorspar and manganese ore are among those expected shortly.

Two Continuous Reheating Furnaces to Serve New Bar Mill

The Timken Roller Bearing Co., Canton, Ohio, will install two continuous bloom-reheating furnaces to serve a new bar mill now under construction. These furnaces, to be furnished by the Rust Engineering Co., Pittsburgh, will each heat 40 gross tons of alloy blooms an hour, the blooms being 10 x 10 in. and 18 ft. in length.

Blooms will be charged in one end of the furnace and pushed throughout its length of 69 ft., being discharged by gravity to the roller table. The furnaces are of Rust triple-fired type, for which patents have been applied, utilizing a soaking chamber at the discharge end which is separate from the main portion of the heating furnace and is independently controlled as to temperature. This feature permits the condition of the steel being discharged to be uniform and independent of rate of firing and tonnage output.

The Rust refractory tile recuperator will be utilized on these furnaces, to deliver highly preheated air to the main furnace firing ports. The fuel will be natural gas.

Producto Machine Co. Takes Over Bilton Machine Tool Co.

The Producto Machine Co., 990 Housatonic Avenue, Bridgeport, Conn., has been organized and has purchased the entire assets of the Bilton Machine Tool Co., Bridgeport, from Homer Cummings, receiver of that company. The same organization which has operated through the receivership of the Bilton company is continuing with the Producto organization and financing has been provided to carry on the business without interruption. The Producto-matic milling machine will continue to be the company's principal product and cam millers, gear millers, Bristol hand millers, die sets, special cutters and gray iron castings will also be manufactured.

Officers of the company are William J. Grippin, chairman; N. M. Marsilius, president and general manager; Frederick Rhodes, first vice-president; E. A. Harper, vice-president in charge of Detroit sales; E. G. Rogers, vice-president in charge of foundry sales; A. J. Cummings, vice-president in charge of Eastern machinery sales; George H. Weber, secretary, treasurer and assistant general manager, and R. S. Lathe, assistant secretary and assistant treasurer.

National Bearing Metals and American Brake Shoe Propose Consolidation

Stockholders in the American Brake Shoe & Foundry Co., New York, and the National Bearing Metals Corporation, St. Louis, have been asked to ratify a proposed combination of the two companies. The plan calls for a mutual purchase of interest in each company by the other, but with both organizations retaining their identities. The Brake Shoe & Foundry company manufactures brake shoes for railroad cars and iron castings. Its plants are located at Norwood, Mass.; Mahwah, N. J.; Buffalo; Baltimore; Portsmouth, Va.; Chattanooga, Tenn.; Pittsburgh; New Richmond, Ohio; Chicago, Burnside and Melrose Park, Ill.; Minneapolis; Kansas City, Mo.; Houston, Tex., and Denver, Colo.

The National Bearing Metals Corporation was organized last June as a merger of the More-Jones Brass & Metal Co., St. Louis; the Keystone Bronze Co. and the Bronze Metal Co., Pittsburgh; the Brady Brass Co., Jersey City, N. J., and the Southern Brass Works, Portsmouth, Va. It manufactures brass and bronze products of all kinds.

Pittsburgh and Ohio Mills Oppose Cut in Chicago-New Orleans Freight Rate

PITTSBURGH, April 10.—A proposal of the Illinois Central Railroad to reduce the freight rate on iron and steel products moving from the Chicago district to New Orleans, for trans-shipment via the Panama Canal to Pacific Coast ports, from 55c. per 100 lb. to 31c., effective June 1, is vigorously opposed by Pittsburgh, Youngstown and Cleveland district steel companies. Traffic managers of the steel companies in these districts met here yesterday at the Chamber of Commerce, and it was decided that each representative present would immediately file a request in writing with the traffic executives of the trunk lines urging them to prevail upon the Illinois Central to withdraw its proposal. It was further decided that if this is not accomplished the carriers be asked to reduce the rates from Pittsburgh, Youngstown and Cleveland to Baltimore by a relative amount. On this basis, with a rate of 31c. from Chicago to New York, the Pittsburgh-New York rate would be 60 per cent thereof or 18½c. per 100 lb. With the usual differentials to Philadelphia and Baltimore of 2c. and 3c., respectively, the rates to those points from Pittsburgh would be 16½c. and 15½c., respectively.

The present rate from Pittsburgh to Baltimore, a distance of 311 miles, is 31c. per 100 lb. and applies on traffic for trans-shipment to Pacific Coast ports. The identical rate proposed by the Illinois Central from Chicago to New Orleans would apply on shipments for a distance of 912 miles, or approximately three times the Pittsburgh-Baltimore mileage.

CONTENTS

April 12, 1928

This Issue in Brief

Employees' lunchroom pays in improved morale, even if food is served at a loss. One large organization has canteens placed at handy locations through the plant. No order is over 5c., and 5,000,000 orders are served yearly.—Page 1003.

Buyer ultimately suffers when sellers indulge in price-cutting orgy. Selling below cost often induces skimping in quality and frequently results in bankruptcy, with consequent disruption in sources of supply.—Page 1005.

Activity of steel consuming industries is favorable to a sustained high level of steel production, Dr. Haney indicates. Index of composite steel demand is at the highest level since September, 1926.—Page 1018.

Powdered coal cupola saves 30 per cent of fuel cost. Fuel is blown into new German cupola at high velocity, being introduced through special small tuyeres 6 in. or 7 in. above the regular cupola tuyeres.—Page 1028.

Is there a tendency toward lessened emphasis on price? Yes, says trade association executive, pointing out that several large organizations have taken the lead in allowing the supplier a fair price, and giving more consideration to quality and service.—Page 1005.

Applies rolling mill slip drive to three-high plate mill. Customary pinions and pinion housing are eliminated, and in their place is a light nest of gears, between flywheel and mill spindles. Mill torque is increased about 75 per cent.—Page 1004.

Intricate cylindrical castings may now be made by centrifugal means. "Spun-sorbitic" process produces a casting highly resistant to wear, and therefore suitable for piston ring drums, cylinder barrels for pumps and motor engines, and sleeve valves. It may be used for automobile engine cylinders.—Page 1008.

Proportions of scrap and pig iron used in open-hearth charges change in parallel with price relation of scrap and iron. In first quarter of 1928 the average proportions were calculated to be 45 per cent pig iron to 55 per cent scrap, showing that more scrap and less pig iron is being used.—Page 1008.

New record in steel ingot output set in the first quarter. Production was 12,544,156 tons, 1.3 per cent above the previous quarterly record made in 1926. March output of 166,945 tons a day was within less than 1 per cent of the previous monthly record established in March, 1926.—Page 1023.

To protect the buyer as well as the seller, provide performance standards for electrical products, Westinghouse executive urges. Would bring about economy and efficiency in production and would insure the user against unsatisfactory service.—Page 1010.

American blast furnaces produce more iron per man and have lower coke consumption than German furnaces, engineer finds. Here the average daily output per man is 6 tons, and in Germany, 5 tons. Operating costs are relatively higher in Germany.—Page 1011.

Difficulties confront European steel cartel. Germans say Belgium sells for export at any price to obtain full works operation, forcing Germany to quote unprofitable export prices. Formation of selling syndicates to control prices is urged.—Page 1022.

No season-cracking in brass containing 80 per cent copper, declares metallurgist. But brass of 75 per cent copper, he says, will season-crack under atmospheric corrosion, and will also dezincify.—Page 1009.

Human element is accountable for 90 per cent of foundry troubles, says Wilson Foundry executive. Research in foundry materials is valuable, but the human side should not be neglected. He expects much from the technical college graduates now going into foundries.—Page 1027.

First welded railroad bridge is ready to carry traffic. Two main girders are nearly 54 ft. in length and 4 ft. 9¼ in. deep. Welding of the entire construction required 320 man-hours.—Page 1013.

Hand labor gives way to mechanical equipment in new method of making cast iron pipe. Multiple lip ladles, each with 14 spouts, can pour two 6-in. or two 8-in. pipes at the same time. Sand is handled entirely by conveyor equipment.—Page 1002.

Automobile output for first quarter was about 26 per cent above same period in 1927, and prospects for the second quarter are favorable.—Page 1026.

ESTABLISHED 1855

THE IRON AGE

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The Proposed Zinc Cartel

IN 1927 there was a major decline in the price for spelter, and during the last nine months it has stood only a little above pre-war average. This has been satisfactory to users of the metal but very disagreeable to producers. The explanation of this condition, as indicated in an IRON AGE editorial of Jan. 26, is a sudden and huge increase in ore supply that began in 1926 as a consequence of the widespread application of the new process of selective flotation. At no time has the statistical position of the metal looked bad; the market has suffered from the incubus of a huge accumulation of ore stock which may be converted into metal.

The producing interests have been so unhappy in their situation that they have been giving much thought to amelioration of it by the regulation of production. In Europe especially has there been much conversation about the organization of a cartel. American participation in this has been desired, for it is the exportation of a relatively small quantity of American spelter that spills the beans in Europe. It has been rather hard to make Europe understand that American zinc production is derived mainly from such a multiplicity of small mines that any concert of action among them would be impossible, and that anyway our laws do not permit concert of action for any effect upon price. There is some doubt also regarding the British attitude. The present outlook is that the Continental producers at a meeting in May will try tentatively to do something alone.

One answer for the present predicament in zinc is *laissez faire*, just as it is for the similar situation in petroleum. In the long run low prices effect their own cure. There is, however, a broader social view in that the resources of mineral substances are by no means endless, and the reckless squandering of them now, with the consequent production of too low a price, may result in an inordinately high price later on. Dr. W. R. Ingalls, who is an authority in the zinc industry, expressed the opinion in an address last January that the present plethora of zinc ore will be but temporary and that the owners of zinc mines who are minded to hold them in reserve will reap larger profits by so doing. The administrations of some of the most important mining enterprises agree with this idea and have adopted such a policy.

This leads right up to the thought that the real trouble with the zinc industry is that it knows too little about itself. If the producers of zinc took the trouble to study their facts, cooperating for that purpose, their own intelligence would tend to restrain them from spendthrift behavior. The situation of copper could quickly be made as bad as that in zinc. Formerly copper producers used to emulate each other in making it so; but they have acquired a better economic perception, based on the ascertainment of facts.

In the course of time the zinc producers of the world will learn the same lesson, but this will require several years even if they begin now. In the meanwhile they want some speedy adjustment. Hence the hopes for a European cartel. Assuming the consummation of such a plan there will probably be no illusions among its participants. Rather there will be a spirit of curiosity to discover how it will work.

If zinc were more largely produced by concerns that smelt their own ore the chance of regulation would be better, but inasmuch as smelters buy the larger part of their ore supply their objective must be to better the price for metal while keeping the ore price low, which is not so easy. This leads back to the idea that the only real solution is to make an increasing proportion of ore producers averse to sacrificing their resources at little or no profit.

DESPITE the fact that pig iron production in the first quarter of 1928 had been exceeded by nine preceding first quarters, steel ingot production in the first quarter was the largest on record. Dependence on scrap in larger and larger proportions has accounted for this change in the ratio between the two great tonnage movements in the industry. It is estimated that open-hearth charges in the first quarter of this year were below

45 per cent in pig iron content, compared with considerably more than 50 per cent in a number of recent years. Study of the factors shows close accord between the price ratio of scrap against pig iron, on the one hand, and the operating ratio involving percentage of pig iron in the charge, on the other. For the most part, these curves (shown in another column) are almost parallel, as traced over a period of some fifteen years.

More Students, Not More Schools

NOT long ago the faculty at Purdue University decided to create a department of metallurgy, sensing a well defined demand for men trained in metallography, heat treatment, and physical metallurgy and believing that no institution in the immediate vicinity of Chicago (from which region the demand appeared to spring) is prepared to educate these specialists. Another piece of news is that one of the older eastern colleges is considering whether a languishing mining department cannot be rejuvenated by grafting on to it a course in metallurgical engineering.

Without doubting that there is a great need for educated men in the metal-working industries, it is very doubtful whether it would be advisable just now to establish more schools to teach metallurgists. Off-hand one would say that there is already a great over-expansion of capacity. Over-expansion in the educational industry is as harmful as over-expansion in any other line of production. Both mean high overhead and far from adequate return on the effort expended.

In order to verify the impression that the available facilities are by no means fully utilized, a personal letter was addressed to 22 men at colleges and universities known to have competent teachers and adequate equipment for the fundamentals of iron and steel metallurgy. Two of them did not answer; four of them replied that all instruction on metals was incidental to other degrees; and 16 of them gave statistics on upper class attendance. In all, these sixteen schools will graduate 81 metallurgical engineers specializing in iron and steel. One hundred and seven juniors are following along. This is just about enough to keep three faculties reasonably busy and happy, let alone sixteen!

These attendance figures would appear to indicate that the number of graduates will grow. It may also be argued that the growth of the American Society for Steel Treating indicates a demand for far more men than these 16 schools are actually preparing. Or, if we concede that there are 5000 engineers in charge of heat treating or other distinctively metallurgical work on the production of alloys and articles manufactured therefrom, it follows that these should be replaced in one generation, or at the rate of 250 per year. Furthermore, several professors say they have places offered for from two to four times as many graduates as are available.

Granted all this, the fact remains that the situation cannot be bettered by a further increase in educational plant when the existing capacity is working at only a 20 per cent rate. If the existing capacity is inadequate or antiquated, it should be scrapped and replaced; but it is safe to say that the new courses proposed will not be better than most of the ones now operating. This does not mean that the present facilities are the pink of perfection, but it is sure that what we now have cannot be improved materially as long as the classes are starved in attendance.

If this situation is to be changed it can be done by State universities campaigning among the high schools, or by manufacturers encouraging bright young men in their employ to take up the new profession in greater numbers. It is one college course where the attendance is not embarrassingly large, and leads to a type of work for which there is and will be for many years a steadily increasing demand. But it would be better to populate the metallurgical courses now existing, than to go about starting others.

Much More Pig Iron to the Stack

NEWS is not uncommon nowadays of particularly large production by individual blast furnaces. Daily outputs now and then run into four figures and a case of this sort, in which the furnace used no scrap but its own, was recorded in last week's IRON AGE, page 965.

A study of averages is prompted. No selection can be made that would cover periods of identical circumstances, but it would appear that in 20 years outputs per stack have fully doubled and in nine years they have increased by one-half. The two periods here taken for comparison with last month are March, 1908, and June, 1919.

There was record high pig iron production in October, 1907, the stock panic month. The following March production was less than half as great. Our report for that month showed a mean of 150½ stacks in blast, with a total daily production of 39,619 tons, or 263 tons per stack. Certainly it must be assumed that furnaces running at such a time were in the main the very best in the country.

After the war there was a great decline in production. In the following June, 1919, with a mean of 187½ furnaces in blast there was total daily production of 70,495 tons, or an average of 357 tons a stack. Again the furnaces in blast must be taken as very largely the pick of the industry.

Last month there was heavy production, but it was not a month of picked furnaces, production being 19 per cent above the low of 1927. There was a mean of 192 stacks in blast, with a total daily production of 103,215 tons, and an average of 538 tons per stack, making 51 per cent gain over June, 1919, and 104 per cent gain over March, 1908; yet with the advantage in favor of the previous periods, for then it was rather only the picked furnaces that were running.

Numerous influences have contributed to these increasing outputs. It is not a matter of iron ore, as the average content of Lake Superior iron ores as shipped has not varied materially. Gradual exhaustion of the richer ores has been met by increased beneficiation of lean ores.

It is substantially a matter of furnace lines and furnace practice. With the Duquesne blast furnaces of over 30 years ago there was ushered

in a period of giving furnaces more air; but by 20 years ago that improvement was fairly well in vogue. A surprising increase occurred by widening hearths. The best furnaces themselves are somewhat larger, and with building of new stacks and abandonment of smaller furnaces the average size has increased. All along the line practice has improved. Coke consumption per ton of iron has gone down, but the typical furnace manager makes no special effort to save by-product coke, which on account of gas and by-products does not cost him much.

The plain prospect, therefore, is that the building of blast furnaces in future will be chiefly for replacement of less fit furnaces than by way of addition to the total number.

A Thought for the Ultra-Conservative

YOU have met the "way-back-when" executives —the men who fend off a new proposal by recalling and reminding you of things that happened in years gone by at such-and-such a place, and how the plan can't work because so-and-so then tried it and failed. We have lots of them now. There always have been lots of them.

There was a fair sprinkling of them at a British Iron and Steel Institute meeting in 1878, listening to the dean of British ironmasters read a paper describing large-scale but unsuccessful experiments in eliminating phosphorus from pig iron. Eminent authorities had agreed that phosphorus is almost entirely inert to oxygen at steel making temperatures. A respected Swedish metallurgist and teacher was saying, "It is well known that phosphorus must be removed from iron as a salt of phosphoric acid passing into the cinder and neither the Bessemer nor the refining hearth process admits of this."

Naturally the audience lifted its eyebrows with tolerant amusement, and doubtless the chairman was slightly embarrassed, when a young unknown (who later turned out to be a police clerk) arose in open meeting and remarked that he had been successful in slagging off phosphorus in a Bessemer converter.

The police clerk promptly sent a paper to the institute describing the method, but the then equivalent of the Meetings and Papers Committee contained a majority of "way-back-when" men; for this remarkable contribution was neither read nor discussed, nor published for nearly a year. By that time Sidney Thomas, his cousin Percy Gilchrist, and the friendly steel maker E. Windsor Richards, had worked out most of the problems of a basic refractory lining and the control of the bessemerizing operation. The Germans pounced upon the basic Bessemer as being the very thing for high-phosphorus Lorraine ores, and in 1926 this process (foolish and theoretically impossible in 1878) made about 16,000,000 tons of "Thomas" steel, throwing off as a by-product some 3,000,000 tons of phosphate slag for fertilizer.

Some artist should paint a picture of the Meetings and Papers Committee in 1878 sitting in deliberation upon this paper by Thomas and Gilchrist. It should be reproduced. It would make a wonderful gift for your "way-back-when" friend.

CORRESPONDENCE

"Wanted: Generals for America's Industrial Army"

To the Editor: This caption is quoted for the reason that it concisely puts a vital industrial need. Industrial leaders seem to be in a quandary as to how to create a more intelligent class of men within the ranks. They wonder how and where to get men who will measure up to a higher standard of leadership. All manner of methods are being suggested and many of them are being tried, but the problem is not yet solved.

It seems to me that the whole matter is too vague. Industry is calling for a higher standard of intelligence and leadership, but fails to answer the question, "What is the present standard and how was it established?"

The question might be raised whether industry is not establishing too high a standard—possibly a false standard—and expecting the college graduate to measure up to it. A successful man is prone to forget his earlier contact with industrial affairs and to lose sight of the fact that possibly he showed much less promise than many of the young college men of today whom he chooses to criticize or possibly condemn. This results in the often heard statement that industry needs men of higher intelligence, but that college graduates will not measure up to such requirements. If the young men graduating from our institutions of learning do not measure up to the needs of industry, then through what channel or by what process are we to secure men who can in any manner measure up to the standard being set?

Judging by the general trend of comment, the impression is fixed that industrial training cannot be imparted to the student mind except by industry itself. Without doubt this belief is based on the theory that intelligence follows in the wake of experience. Even in this advanced day, when seeking men for positions of responsibility, the antiquated inquiry is still made, "How much experience has he had in our particular line of work?"

Here is where industry and the college graduate cross swords. It must be granted that the college graduate has shown but little inclination to adapt himself to industrial pursuits or prior to graduation to give serious thought to what may be expected of him in such activities. In fact, it is hard to determine his state of mind, when with diploma in hand he steps out to face the world. It is quite evident, however, that his expectations are at marked variance with the offerings.

It is more than possible that the young graduates are attaching too much importance to the equipment they have acquired in college. Consequently they are not altogether free from blame for the present situation. Possibly they are expecting to be accepted on higher terms than it is possible to offer. This leads some of them to sacrifice their years of study and enter professional athletics; yet it must be admitted that the latter hold out tempting inducements to those especially skilled.

Here is the nut of the situation. Any industry will offer special inducements for special skill. Rightly or wrongly, industry attaches a lot of importance to working up from the ranks, thus acquiring the necessary skill to assume positions of responsibility. "From water boy to president" makes a great slogan; but the college graduate can't subscribe to such a policy, for the reason that he believes that his years of study and his higher mental attainments fit him to assume responsibilities on more favorable terms than are offered.

The college graduate rightly feels that his mental training should allow him to assume responsibilities of

a higher order. I recall a man of ability and high intelligence who entered the employ of an industrial corporation when it was suffering from mismanagement. This man brought about economic results beyond expectations. One of the officers of the company in reviewing the accomplishments remarked: "The trouble with our company has been that it never had a practical boss until it got you." This official got the surprise of his life when the "boss" explained that he had never done work of this nature before. Here is a case in which good thinking solved industrial problems where experience failed.

Industry now puts a premium on "practical experience" because industry has been built to its present proportions on a foundation of experience, experience gained through rule of thumb activity, rather than intelligent planning by educated minds. It would appear that if our industrial position is to advance, it must have men who can grasp the details of its operation more quickly and more effectively. Time will not permit a commercial organization to take crude human material and train it to understand and handle a vast amount of detail. College graduates should provide the necessary recruits and doubtless would, if a clearer formulation of the requirements could be made.

JAMES B. ORBISON.

Springfield, Ohio.

SCRAP PRICES AVERAGE HIGHER

First Quarter 2 Per Cent Above Last Quarter of 1927 but Recent Trend Downward

AVERAGE prices of heavy melting steel scrap at Chicago, Pittsburgh and Philadelphia have been higher during the first months of 1928 than they were in the last three months of the preceding year. At a $13.69 average for the quarter, however, they were more than $1 below the $14.80 average of the first quarter of 1927. The high point of the recent quarter was reached in February. The March average of $13.65 is just $1 below the corresponding average of one year ago.

Meantime pig iron has shown a fair recovery from the low levels of November and December, having stood at a monthly average of $17.73 in both February and March, or 1 per cent above the December figure. For the quarter the average was $17.70 against $19.18 for the first quarter of 1927.

Finished steel has been subject to slight fluctuations only, since early 1927. For the recent quarter it has shown a distinct advance above the last quarter of the preceding year, however, having averaged 2.347c. a lb., against 2.309c. a lb. The recent figure is well below the average for the first quarter of 1927, which stood at 2.392c. a lb. February and March showed a good recovery from the low figure of November, as indicated in the table.

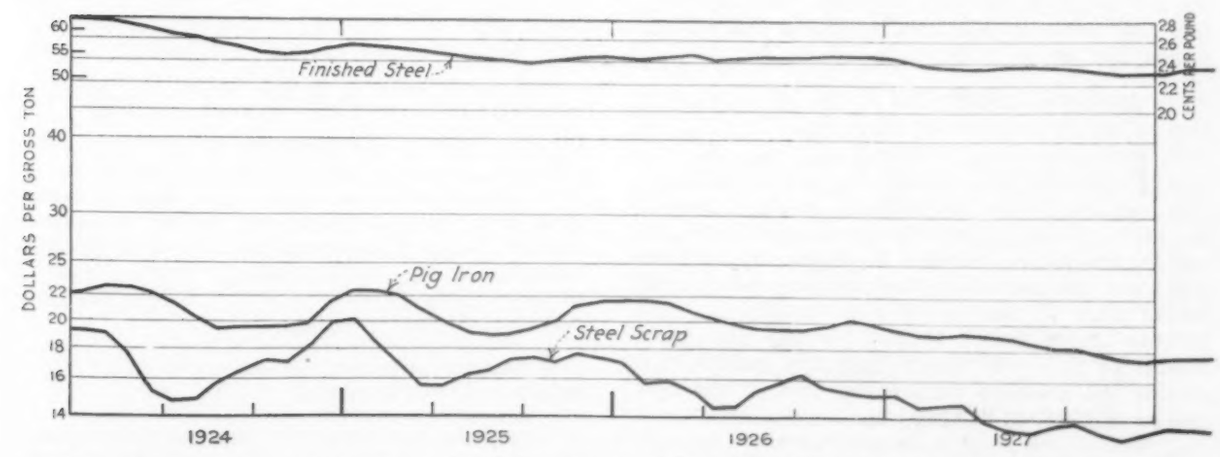
Comparative figures for a considerable number of months, covering steel scrap, pig iron and finished steel, are given in the table. The diagram carries the story of these changing prices over a period of more than four years.

COMPOSITE PRICES ON IRON AND STEEL PRODUCTS

	(Per Gross Ton) Steel Scrap	Pig Iron	Finished Steel, Per Lb.
1925 *average*.....	*$17.12*	*$20.58*	*2.465c.*
January, 1926	16.97	21.79	2.447c.
February	15.50	21.77	2.428c.
March	15.83	21.65	2.433c.
April	15.27	20.96	2.429c.
May	14.35	20.69	2.416c.
June	14.40	20.00	2.420c.
July	15.42	19.51	2.431c.
August	15.88	19.46	2.431c.
September	16.25	19.46	2.439c.
October	15.58	19.69	2.449c.
November	15.25	20.13	2.453c.
December	15.08	19.94	2.453c.
Year's average....	*15.48*	*20.42*	*2.439c.*
January, 1927	15.17	19.44	2.432c.
February	14.58	19.07	2.378c.
March	14.65	19.03	2.367c.
April	14.71	19.21	2.360c.
May	13.95	19.09	2.360c.
June	13.60	18.92	2.369c.
July	13.48	18.56	2.367c.
August	13.80	18.17	2.367c.
September	13.92	18.03	2.357c.
October	13.48	17.96	2.319c.
November	13.18	17.59	2.299c.
December	13.48	17.55	2.310c.
Year's average....	*14.00*	*18.55*	*2.357c.*
January, 1928	13.70	17.63	2.318c.
February	13.71	17.73	2.361c.
March	13.65	17.73	2.362c.
Quarter's average.	*13.69*	*17.70*	*2.347c.*

Edgar Thomson Works Sets New Plant Records in Steel Production

Sixty-three daily, weekly and monthly plant production records were established during March by the Edgar Thomson Works, Carnegie Steel Co., Braddock, Pa. Production of 132,894 gross tons of pig iron from seven blast furnaces bettered by almost 3000 tons the best previous seven-stack output of 129,943 tons made in May, 1927. From 16 open-hearth furnaces there was tapped last month 98,146 tons of steel, which compares with a previous record of 87,160 tons in October, 1920, from 14 furnaces. The blooming mill in March rolled 101,357 tons, comparing with a previous high mark of 95,414 tons in October, 1916, while the four rolling mills, Nos. 1 and 4 on sheet bars, and Nos. 2 and 3 on rails, turned out 98,004 tons against 91,114 tons in October, 1916, the previous record production for one month.



After Declining Irregularly Since the Beginning of 1925, with Occasional Partial Recoveries, Scrap Prices Have Lately Been Slightly Higher. Pig iron and finished steel have fallen during the same period, but much less abruptly

Iron and Steel Markets

Output Holds After Record Quarter

Mill Operations Continue at High Rate—Advance in Pipe Drives in Tonnage—Automobile Body Sheets Decline—Melting Scrap Price at Pittsburgh Up 50c.

FOLLOWING a record output in the first quarter, steel mills are maintaining operations at the high rate reached in March. Heavy specifications late last month, particularly in plates, shapes and bars, assure a good mill engagement through April. Meanwhile, with little buying of heavier rolled products at second quarter prices and no unusual pressure to sell, price tests are still deferred.

Such changes in steel prices as have occurred have been discordant. Weakness in lighter products, notably sheets, is balanced by greater strength in steel pipe. The advance of a week ago in pipe drove in a large tonnage at the previous prices, since jobbers were given a week in which to cover 30 to 60 days' requirements.

Unsettlement in the sheet market was brought about by a reduction of $3 a ton on automobile body sheets, bringing prices down to 4c. per lb., Pittsburgh, or the same level at which buyers bought for the first quarter. Weakness has extended to other finishes, particularly black sheets, which are now rather generally available at 2.80c., Pittsburgh, or $2 a ton below the last advance. Consumers expect the decline in automobile body sheets to result in a similar revision of quotations on strip steel fender stock, since prices of the two products usually move together.

Prices of primary materials remain substantially unchanged except on scrap. Heavy melting steel at Pittsburgh has advanced for the second time in three weeks and is now 75c. a ton above its low point in the first quarter. Melting scrap has also gone up 50c. at Cincinnati, but has declined 25c. at St. Louis.

A decline of 62,983 tons in March reduced the unfilled orders of the Steel Corporation to 4,335,206 tons, which, however, is much larger than the total of 3,553,140 tons, as of March 31, 1927. The reduction last month was surprisingly small in view of the high rate of production. Estimated ingot output for the entire industry in March, at 4,507,520 tons, was the second highest monthly production, falling short of the record made in March, 1927, by only 28,000 tons. Output for the first three months of this year was a quarterly record, surpassing the previous high mark, that of the first quarter of 1926, by 260,000 tons.

Steel production so far in April has held its own. Sheet mill operations, at 80 to 85 per cent of capacity, are about five points lower than in the last half of March. On the other hand, the week has seen the blowing in of two more steel works blast furnaces, one at Johnstown, Pa., and the other at Haselton, Ohio.

Unfilled orders are probably undergoing further reduction this month, since mills are so largely engaged in rolling steel specified at lower than current prices and most buyers are not yet ready to add to their commitments.

The automobile industry is taking more steel than in March, and it is predicted that the seasonal slowing down in motor car manufacture will come at least a month later than last year.

Railroad buying is again of sizable proportions. Of 17,000 tons of rails bought at Chicago, 13,800 represented a supplementary purchase by the Burlington. Bridge work awarded by the Chicago & North Western calls for 6000 tons of structural steel, and fully 50,000 tons of plates, shapes and bars will be rolled for 4450 freight cars placed by the Chicago, Milwaukee, St. Paul & Pacific.

Structural steel inquiries totaling 37,000 tons include 17,000 tons for an office building in New York. Contracts awarded require 32,000 tons of steel, the largest, 8000 tons, for a bridge over the Delaware River. Among reinforcing steel projects pending is sewer work at Stickney, Ill., requiring 5000 tons.

Tin plate prices for the second half will soon receive more active consideration, since in another week specifications against June quotas are due, winding up contract business for the first six months of the year. It is commonly expected that quotations will remain unchanged.

With the opening of navigation on the Great Lakes and on the New York State barge canal, increased water shipments of pig iron are being planned. At Milwaukee, 6000 tons has been sold for shipment by boat from Lake Erie furnaces. New England consumers will benefit by reduced rail-and-water rates from Buffalo, and at some points even the Everett, Mass., furnace will be somewhat at a disadvantage, considering the lower f.o.b. quotations at Buffalo.

Domestic gravel fluorspar has been advanced $1 a ton to $16 at mines.

THE IRON AGE composite price for finished steel has advanced to 2.362c. per lb. from 2.357c. The composite price for pig iron remains for the third week at $17.67 a gross ton.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Apr. 10, 1928	Apr. 3, 1928	Mar. 13, 1928	Apr. 12, 1927
No. 2 fdy., Philadelphia	$20.76	$20.76	$20.76	$21.76
No. 2, Valley furnace	17.25	17.25	17.25	18.50
No. 2, Southern, Cin'ti	19.69	19.69	19.69	21.69
No. 2, Birmingham	16.00	16.00	16.00	18.00
No. 2 foundry, Chicago*	18.50	18.50	18.50	20.00
Basic, del'd eastern Pa	19.50	19.50	19.50	20.75
Basic, Valley furnace	17.00	17.00	17.00	19.00
Valley Bessemer, del'd P'gh	19.26	19.26	19.26	21.26
Malleable, Chicago*	18.50	18.50	18.50	20.00
Malleable, Valley	17.25	17.25	17.25	18.50
Gray forge, Pittsburgh	18.51	18.51	18.51	19.76
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	100.00	100.00	100.00	100.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	33.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	33.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	34.00
Forging billets, P'gh	38.00	38.00	38.00	40.00
O.-h. billets, Phila	38.30	38.30	38.30	39.30
Wire rods, Pittsburgh	44.00	44.00	44.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.12
Iron bars, Chicago	2.00	2.00	1.90	2.00
Steel bars, Pittsburgh	1.85	1.85	1.85	1.90
Steel bars, Chicago	2.00	2.00	1.95	2.00
Steel bars, New York	2.19	2.19	2.19	2.24
Tank plates, Pittsburgh	1.85	1.85	1.85	1.85
Tank plates, Chicago	2.00	2.00	1.95	2.00
Tank plates, New York	2.17½	2.17½	2.17½	2.19
Beams, Pittsburgh	1.85	1.85	1.85	1.90
Beams, Chicago	2.00	2.00	1.95	2.00
Beams, New York	2.14½	2.14½	2.14½	2.19
Steel hoops, Pittsburgh	2.20	2.20	2.20	2.30

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Apr. 10, 1928	Apr. 3, 1928	Mar. 13, 1928	Apr. 12, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	*2.80*	2.85	2.90	2.75
Sheets, black, No. 24, Chicago dist. mill	3.00	3.00	3.00	2.95
Sheets, galv., No. 24, P'gh	3.65	3.65	3.65	3.65
Sheets, galv. No. 24, Chicago dist. mill	3.85	3.85	3.85	3.85
Sheets, blue, 9 & 10, P'gh	2.10	2.10	2.10	2.20
Sheets, blue, 9 & 10, Chicago dist. mill	2.20	2.20	2.20	2.35
Wire nails, Pittsburgh	2.65	2.65	2.65	2.55
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.60
Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.45
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.25
Barbed wire, galv., Chicago dist. mill	3.40	3.40	3.40	3.30
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	**$15.50**	$15.00	$14.75	$16.75
Heavy melting steel, Phila.	13.50	13.50	13.50	14.50
Heavy melting steel, Ch'go	12.50	12.50	12.75	13.25
Carwheels, Chicago	13.50	13.50	14.00	15.25
Carwheels, Philadelphia	15.50	15.50	15.50	16.00
No. 1 cast, Pittsburgh	14.50	14.50	14.50	16.00
No. 1 cast, Philadelphia	16.00	16.00	16.00	17.00
No. 1 cast, Ch'go (net ton)	*14.00*	14.50	14.50	16.50
No. 1 RR. wrot. Phila.	15.00	15.00	15.00	16.50
No. 1 RR. wrot. Ch'go (net)	11.00	11.00	11.00	12.50
Coke, Connellsvile, Per Net Ton at Oven:				
Furnace coke, prompt	$2.60	$2.60	$2.60	$3.25
Foundry coke, prompt	3.75	3.75	3.75	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.30	14.30	14.25	13.12½
Electrolytic copper, refinery	14.12½	14.12½	14.00	12.75
Zinc, St. Louis	**5.75**	5.72½	5.65	6.40
Zinc, New York	**6.10**	6.07½	6.00	6.75
Lead, St. Louis	**6.00**	5.95	5.82½	7.00
Lead, New York	6.10	6.10	6.00	7.25
Tin (Straits), New York	*52.00*	53.50	50.12½	67.75
Antimony (Asiatic), N. Y.	**9.62½**	9.50	10.50	15.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Uncertainty Over Prices Clouds Otherwise Good Steel Situation—Sheets Weaken

PITTSBURGH, April 10.—The March rate of steel production is maintained, and in most finished products the tabulation discloses such free ordering against expiring first quarter contracts toward the close of last month that manufacturers are confident that this month will show little or no falling off in steel ingot output.

There is, however, fresh uncertainty about prices. This is because of the fact that producers have weakened again on automobile body sheets, which, having stood at 4.15c., base, for several weeks, are no longer quotable at more than 4c. on actual business. This break of $3 a ton, which appears to have developed not from pressure on the part of consumers, but from a desire for business by a few small producers, has not only shaken the sheet market, but the generally more confident feeling in all lines that began to be apparent a week or 10 days ago. If the automotive industry were less exacting as to quality, the large demands upon producers from that quarter might be some excuse for price concessions, but the common report is that motor car builders, while not now exerting pressure against prices, are unrelenting in rejections on the score of what steel manufacturers regard as slight imperfections.

Shipments of finished steel products are heavy, but as there has been a noticeable falling off in new business, there is no doubt that order books are being reduced. The principal outlet still is the automobile industry, with building and construction and agricultural implement manufacturers following in line. Tin plate continues to give a good account of itself, and the advance in merchant pipe appears to have stimulated business in that product. But the oil industry still is buying little, and the lack of railroad rolling stock business still is commented upon. Nails are making the poorest showing among wire products because of the heavy deliveries early in the year against low-priced orders taken in December.

Among the primary materials, interest centers in the steel works grades of scrap, which have advanced another 50c. a ton, and heavy melting steel now is 75c. a ton above its price of a month ago. This advance is not due so much to fresh consumer buying as to the insistence on deliveries against old orders in keeping with the high rate of steel production. Dealers, in trying to cover, have not only found supplies scant, but have been alarmed by the fact that the April scrap list of the Baltimore & Ohio Railroad went to a steel company not regularly a scrap buyer on a direct bid. Higher prices may be seen, but the more common belief is that the upswing is merely a flurry to be halted by lessened steel works' requirements with the approach of summer. Pig iron shows neither life nor strength and the same statement applies to coal and coke.

Pig Iron.—Additional purchases of pig iron by the company reported last week to have bought 5000 tons of No. 3 foundry have swelled its takings to 20,000 tons, about half of which was Bessemer iron. This grade sold at $17.50, Valley furnace, the price which has ruled for some time on smaller lots. At least 1000

tons more of this grade has been sold at the full price. The No. 3 foundry appears to have been sold at somewhat above the regular price of that grade. Nothing more than the usual carload lot business has been done in other grades of foundry or in malleable iron. Basic iron also has been inactive. Valley furnaces still are quoting basic at $17, but as there have been no sales, that quotation is merely nominal and is admittedly impossible to obtain in the Pittsburgh district. While local steel companies appear sold up or have no iron for sale, there are offerings by middlemen of Pittsburgh district steel company basic at delivered prices which are equivalent to about $16 at Valley furnaces. The Republic Iron & Steel Co. has put on its one idle Haselton blast furnace, and Bethlehem Steel Co. has added a furnace at its Cambria Works, Johnstown, Pa., making seven of the 10 furnaces at the latter plant active.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.00
Bessemer	17.50
Gray forge	16.75
No. 2 foundry	17.25
No. 3 foundry	16.75
Malleable	17.25
Low phosphorus, copper free	27.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Steel works operations are holding well up to the March rate, and in consequence there is a sustained rate of specifications against contract tonnage of the commonly used ferroalloys. New business does not amount to much. Prices are unchanged.

Semi-Finished Steel.—There is a fairly good movement of billets, slabs and sheet bars, but it is largely on arrangements which have long been in force between producers and non-integrated manufacturers. Open market activity is limited. Some users of wire rods who failed to get in specifications against first quarter contracts before they expired have been obliged to pay the present price, but not much tonnage is involved.

Fluorspar.—One of the larger domestic producers has announced a price of $16 per net ton, f.o.b. mines, for gravel spar analyzing 85 per cent calcium fluoride and not over 5 per cent silica, effective April 9. About a week ago, several producers announced a withdrawal of prices of less than $15, and the advance by one producer, which will probably be followed by others, is not altogether an unexpected development. Most producers still have contracts taken at $14 to $14.50 to complete.

Bars, Plates and Shapes.—Heavy specifications in the last week of March against first quarter contracts appear to have supplied much of this month's requirements of these products, and in the past week new business has been rather light. The mills are well supplied with orders against which they can ship and also have written a good deal of second quarter contract business. There is no pressure to sell and no pressure on the part of buyers against prices; consequently, there is no talk of prices lower than 1.85c., base Pittsburgh, except in reference to current deliveries on late first quarter contract specifications.

Rails and Track Supplies.—The railroads are taking out rails and track supplies in good volume against old orders, and in the latter item seem more disposed to carry moderate stocks instead of ordering in strict accord with track-laying programs. Light-section rails still are very dull.

Wire Products.—Makers have been fairly successful in getting second quarter contracts signed at the full quotations, but specifications against them are light and will probably remain so during this month because of the fact that buyers took full advantage of the opportunity to specify late last month on first quarter commitments carrying lower prices. The market does not appear as well established as to prices on nails as on the other products, in spite of the fact that many jobbers have signed second quarter contracts at $2.65 per keg, base Pittsburgh. The heavy shipments of the first two months of the year have left jobbers with big stocks and in reducing them they are setting up considerable competition for the mills, some of which are adding to preferential customer lists in getting new business.

Tubular Goods.—The recent revision in prices of standard-weight and line pipe has had the effect of materially stimulating the demand. Jobbers were given one week in which to specify 30 or 60 days' requirements at the old prices. Reports about business in standard-weight pipe are much more cheerful than recently. There is a very fair business in line pipe in small lots, but the larger tonnage projects do not appear to be moving with much speed toward the mills. The new quotation on line pipe to jobbers is card less one point and three fives on sizes larger than 3½-in. outside diameter. On 3½-in. and smaller, the standard-weight pipe list applies with one point less discount on line couplings. On seamless oil well casing, the former discount of 20 per cent to jobbers has been revised to 10, 5 and 5 per cent. Demand for oil country goods still is slow, but in spite of the fact there is some talk of an upward revision of prices.

Sheets.—Prices have become somewhat unsettled as a result of the weakness that has developed in the Detroit district in automobile body sheets. One maker is reported to have made a quotation of 4c., base, on body sheets, a cut of $3 a ton, and it was necessary for others to follow to hold their accounts. The market on the common finishes is threatened by this development, as it rarely happens that black sheets can hold up in the face of weakness in the full finished stock, and galvanized sheets have been weak for some time, chiefly because jobbers were so heavily stocked with them at prices that permit a profitable resale at less than 3.75c. While sheet business has been good over the past week —and no small part of it outside of the body sheets has been at full prices—demand is not strong enough to sustain the recent rate of mill engagement and operations of between 80 and 85 per cent of capacity are about five points lower than in the last half of March.

Tin Plate.—Makers still report cheerfully about business and mill operations. In another week, specifications against June quotas are due, winding up first half contract business and bringing into the foreground probable prices on last half contracts. The common impression now is that there will be no change in prices. While makers have held that the first half price reduced

The Iron Age Composite Prices

Finished Steel

April 10, 1928, 2.362c. a Lb.

One week ago	2.357c.
One month ago	2.364c.
One year ago	2.367c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.,	Feb. 14;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

April 10, 1928, $17.67 a Gross Ton

One week ago	$17.67
One month ago	17.75
One year ago	19.21
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	$17.75,	Feb. 14;	$17.54,	Jan. 3
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mill	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
Del'd Philadelphia	2.17c. to 2.22c.
Del'd New York	2.19c. to 2.24c.
Del'd Cleveland	2.04c. to 2.09c.
F.o.b. Cleveland	1.85c.
F.o.b. Lackawanna	1.95c.
F.o.b. Birmingham	2.05c. to 2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.90c. to 2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.

Rail Steel

F.o.b. mills east of Chicago district	1.75c.
F.o.b. Chicago Heights mill	1.80c. to 1.85c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.10c. to 2.15c.
F.o.b. Coatesville	2.00c. to 2.05c.
F.o.b. Sparrows Point	2.00c.
F.o.b. Lackawanna	1.95c.
Del'd New York	2.17½c. to 2.22½c.
C.i.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
F.o.b. Lackawanna	1.95c.
F.o.b. Bethlehem	2.00c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.12c. to 2.18c.
Del'd New York	2.14½c. to 2.19½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
Narrower than 3 in., P'gh	2.20c. to 2.40c.
Wider than 3 in. to 6 in., P'gh	2.10c. to 2.20c.
6 in. and wider, P'gh	*1.90c. to 2.00c.
Narrower than 3 in., Chicago	2.40c. to 2.50c.
From 3 to 6 in., Chicago	2.20c. to 2.30c.
6 in. and wider, Chicago	2.00c. to 2.10c.

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c.
Bars, f.o.b. Chicago	2.20c.
Bars, Cleveland	2.25c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., 1 up to 3 tons, P'gh	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, Cleveland	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, del'd Chicago	3.30c. to 3.45c.
Strips, under 12 in., 1 up to 3 tons, Worcester	3.15c. to 3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.65
Galvanized nails	4.65
Galvanized staples	3.35
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. P'gh—wider than 40 in.	2.20c.
Nos. 9 and 10, f.o.b. P'gh—40 in. and narrower	2.10c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.20c. to 2.30c.
Nos. 9 and 10, del'd Cleveland	2.19c. to 2.29c.
Nos. 9 and 10, del'd Philadelphia	2.32c. to 2.52c.
Nos. 9 and 10, f.o.b. Birmingham	2.25c. to 2.30c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.80c. to 2.90c.
No. 24, f.o.b. Chicago dist. mill	3.00c.
No. 24, del'd Cleveland	2.94c. to 2.99c.
No. 24, del'd Philadelphia	3.12c. to 3.22c.
No. 24, f.o.b. Birmingham	3.05c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.95c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade	3.75c. to 3.85c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.65c. to 3.75c.
No. 24, f.o.b. Chicago dist. mill	3.85c.
No. 24, del'd Cleveland	3.74c. to 3.84c.
No. 24, del'd Philadelphia	3.97c. to 4.07c.
No. 24, f.o.b. Birmingham	3.90c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.00c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. maker's mill.)

S.A.E. Series Numbers		Per 100 Lb.
2000	(½% Nickel)	$2.90
2100	(1½% Nickel)	3.20
2300	(3½% Nickel)	4.15
2500	(5% Nickel)	4.90
3100	Nickel Chromium	3.20
3200	Nickel Chromium	3.65
3300	Nickel Chromium	6.45
3400	Nickel Chromium	5.85
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	3.15
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	3.35
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	3.70
5100	Chromium Steel (0.60 to 0.90 Chrome)	3.00
5100	Chromium Steel (0.80 to 1.10 Chrome)	3.10
5100	Chromium Spring Steel	2.85
6100	Chromium Vanadium Bars	3.85
6100	Chromium Vanadium Spring Steel	3.60
9250	Silicon Manganese Spring Steel	2.90
	Chrome Nickel Vanadium	4.15
	Carbon Vanadium	3.60

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.90
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	1
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

the margin of profit, it is believed this opinion was predicated on pig tin at a higher price than has prevailed. A remarkable feature of the present situation is the smallness of stock lists. Tin plate manufacturers have operated their mills with an eye to keeping production close to readily marketable stock.

Cold-Finished Steel Bars and Shafting.—Parts makers serving builders of the medium-priced motor cars are not ordering as freely as they did recently, but those which supply low-priced car builders are taking shipments freely and the total movement compares favorably with that of last month. Prices are steady at 2.20c., base Pittsburgh or Chicago.

Hot-Rolled Flats.—Strictly new business is light in comparison with that of the two previous weeks, but this reflects no contraction in consumption, but is due rather to the heavy releases on first quarter contracts, shipments against which are amply meeting consumers' needs. Makers were obliged to concede something on prices to large consumers in getting second quarter contracts, but on smaller business the full quotations appear to have prevailed.

Cold-Rolled Strips.—Important consumers still are meeting their requirements from shipments on first quarter contracts and new business is moderate. Prices are still irregular, but extensions or additions to first quarter contracts permitted by manufacturers cause some doubt as to the attainment of the prices announced Jan. 25, last. The drop in automobile body sheets will probably mean a revision of strip steel fender stock, since the two grades usually move together in price.

Bolts, Nuts and Rivets.—Buyers seem to have generally covered their needs for this month in late specifications against first quarter contracts and business so far this month has been rather light. Prices are well maintained.

Coke and Coal.—The market still is extremely dull. Little demand exists for spot furnace coke even for other than blast furnace use and producers who run production a little ahead of their orders find that the surplus is hard to move even at $2.65 per net ton at ovens. There is plenty of spot foundry coke. There is no Lake business to take the place of lighter demands for household coal, and the market is dull and weak. Since not much lump coal is being shipped, the production of slack grade is light and prices are somewhat higher on that grade.

Old Material.—This market has advanced again on the open-hearth grades, with heavy melting steel now quotable at $15.50 to $16, and compressed sheets not obtainable in quantity at under $15.50. The explanation is partly found in a scramble by dealers to cover short sales, induced by insistence of melters for shipments, and the fact that when these demands developed there were few dealers who had any large amounts of scrap in their yards. A contributory factor in the advance is that a steel company which has long been out of the commercial scrap market secured most of the scrap in the April list of the Baltimore & Ohio Railroad on a direct bid, paying $15.50, delivered. Assuming that this may be a permanent policy of the company which bought, dealers have scurried to cover and have paid as much as $15.25 for heavy melting steel for delivery on orders taken at $14.75 and even $15.50 for ordinary heavy melting steel. The heavy steel scrap in the Pennsylvania Railroad April list sold within a few cents of $16 per gross ton, delivered to two points in this district, with a little going to the Youngstown district. There is not much activity in other directions, but sentimentally the market is strengthened by firmness in the open-hearth grades.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$15.50 to $16.00
Scrap rails	15.00 to 15.50
Compressed sheet steel	15.00 to 15.50
Bundled sheets, sides and ends	14.00 to 14.50
Cast iron carwheels	14.50 to 15.00
Sheet bar crops, ordinary	15.50 to 16.00
Heavy breakable cast	13.00 to 13.50
No. 2 railroad wrought	15.50 to 16.00
Heavy steel axle turnings	13.00 to 13.50
Machine shop turnings	10.50
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	16.50 to 17.00
Railroad coil and leaf springs	16.50 to 17.00
Rolled steel wheels	16.50 to 17.00
Low phosphorus billet and bloom ends	18.50 to 19.00
Low phosphorus, mill plate	17.50 to 18.00
Low phosphorus, light grade	16.50 to 17.00
Low phosphorus sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	13.00 to 13.50
Electric Furnace Grades:	
Low phosphorus punchings	16.50 to 17.00
Heavy steel axle turnings	13.00 to 13.50
Blast Furnace Grades:	
Short shoveling steel turnings	11.00 to 11.25
Short mixed borings and turnings	11.00 to 11.25
Cast iron borings	11.00 to 11.25
No. 2 busheling	10.50 to 11.00
Rolling Mill Grades:	
Steel car axles	18.00 to 19.00
No. 1 railroad wrought	11.00 to 11.50
Sheet bar crops	17.00 to 17.50
Cupola Grades:	
No. 1 cast	14.50 to 15.00
Rails 3 ft. and under	15.50 to 16.00
Malleable Grades:	
Railroad	15.50 to 16.00
Industrial	15.00 to 15.50
Agricultural	14.50 to 15.00

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.65c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.10c.
Galvanized corrugated sheets (No. 28 gage), per square	$4.39
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 to 62½ per cent off list
Machine bolts, per 100 count,	60 to 62½ per cent off list
Carriage bolts, per 100 count,	60 to 62½ per cent off list
Nuts, all styles, per 100 count,	60 to 62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb	$3.00 to 3.10
Wire, galvanized soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Government Appeals Decision on Reinforcing Bar Duty

An appeal has been filed by the Government from the decision of Justice I. F. Fischer of the United States Customs Court, Second Division, that reinforcing bars are dutiable as construction material under paragraph 312 instead of as steel bars under paragraph 304 of the tariff act. As a result of Justice Fischer's decision, the duty on reinforcing bars would be reduced from 0.30c. per lb. to 0.20c. per lb.

Following the decision early in February, the Government had 60 days in which to file an appeal, but did not act until March 31. As 60 days more must elapse before action may be taken before the Customs Court of Appeals in Washington, final decision is not possible until after June 1. The Customs Court of Appeals generally adjourns about the middle of June so that unless action is taken soon after the expiration of the 60-day time limit, the case may carry over to next fall.

Newton Steel Co. Refunding Will Provide $1,000,000 for Improvements

Stockholders of the Newton Steel Co. have approved new financing, authorizing $4,000,000 6 per cent preferred stock to replace present 7 per cent preferred, which will be called at $110. Of the new authorization 22,500 shares of $100 par value stock will be issued at this time. After retiring the outstanding preferred, about $1,000,000 will be available for plant improvements.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾-in.	$33.50 to 34.00
Forging, ordinary	38.00 to 39.00
Forging, guaranteed	43.00 to 44.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$44.00
Screw stock	$5.00 per ton over base

*Chicago mill base is $45. Cleveland mill base, $44.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, Swedish, average 66% iron,	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.25 to $10.75

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.60 to $2.75
Foundry, f.o.b. Connellsville prompt	3.75 to 4.50
Foundry, by-product, Ch'go ovens	9.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.45 to 9.85
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.80
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.10
Gas slack, f.o.b. W. Pa. mines	1.10 to 1.20

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid	100.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $32.00
Domestic, 16 to 19%	29.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50 to $88.50
75%	130.00 to 140.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	92c. to 95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$15.00 to $16.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	——
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	80, 10 and 2½
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh	80, 10 and 5
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10 to 70
F.o.b. Cleveland	70 and 10 to 70
F.o.b. Chicago	70 and 10 to 70

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Steel Specifications Third Largest for Any Week This Year

CHICAGO, April 10.—Ingot output in this district in the first quarter was larger by a fair margin than in the corresponding period a year ago. The total for the month just closed, however, did not quite equal the record made in March, 1927.

The character of this market has not changed in the week unless it is a trifle stronger. Orders now on mill books, plus the tonnage which producers feel will come to them in the next two months, lead to the belief throughout the trade that a substantial volume of business is assured in the second quarter. Specifications for finished steel are the third largest for any week so far this year and they stand second to the best week of last year. Sales, not counting rails and track accessories, bulk large and are in excess of shipments. Long range buying is almost wholly absent, and this fact readily leads to the general belief that current orders are non-speculative and are for actual consumption. Steel mill backlogs average well up to the six weeks' mark, and deliveries on finished steel products range from four to six weeks.

Notwithstanding the favorable condition of order books, prices on bars, shapes and plates still show some variation, usually about $1 a ton. Some sellers, feeling that they must compete against shipments being made against old contracts taken at prices below 2c., are willing to take attractive business at 1.95c.

Pig Iron.—Shipments of Northern foundry iron continue to creep up, and the average so far in April shows a material improvement over that of March. New sales are large when consideration is given to the uniformity of purchases over the last four or five weeks. A large portion of this business is spot iron or tonnages that are needed to fill out the second quarter. Third quarter inquiry and sales are gaining in importance. It is reported that a mixed cargo of pig iron and finished steel left Buffalo by water for Chicago April 4. It is considered highly probable by many that shipments from Cleveland to Chicago soon will be made. Orders for iron to come by boat to Milwaukee are said to aggregate not less than 6000 tons. Two cargo vessels have already come to Milwaukee and Chicago from Detroit, showing that passage ways between the Lakes are now cleared of ice.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$18.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	19.00
Malleable, not over 2.25 sil.	18.50
High phosphorus	18.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	22.01
Southern No. 2 (barge and rail)	21.18
Low phos., sil. 1 to 2 per cent, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—This market is quiet in new sales, but specifications are heavy. Prices are steady.

Prices delivered Chicago: 80 per cent ferromanganese, $107.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $38.76 to $39.76.

Fluorspar.—Sales of this commodity are small, and prices are well established at $15, f.o.b. Illinois mines, for the 85 per cent grade. Shipping orders against recent contracts are of good size.

Bolts, Nuts and Rivets.—Specifications for these commodities are a trifle heavier. Automobile plants and manufacturers of farm machinery are the largest users. The railroads are taking normal quantities for this time of the year. Output for the industry as a whole is estimated at a shade under 70 per cent of capacity.

Coke.—Shipments of by-product foundry coke are large, being a shade heavier than in the closing week of March. Prices are firm at $9, f.o.b. local ovens, and $9.50, delivered in the Chicago switching district.

Plates.—Over 50,000 tons of plates, shapes and bars will be required for the 4450 freight cars ordered this week by the Chicago, Milwaukee, St. Paul & Pacific from eight Western car shops. This business wipes out the last of the large inquiries that have been before the trade this year. There is still talk that the Illinois Central and the Rock Island will come into the market for freight car equipment, but there is no assurance that they will do so before the early summer months. Car builders are losing interest in the 500 cars, on which prices were asked some weeks ago by the Chicago & Eastern Illinois, as it is generally believed that these cars will be built in the railroad's own shops. Two oil producers in the Southwest have ordered a total of 3200 tons of plates. Fresh inquiry from this source is for 500 tons, bringing the total of unclosed business in tankage materials to 4500 tons. Recent car orders and requirements of local fabricators are adding sizable tonnages to local mill books, and deliveries now range from four to six weeks. Prices are steady at 2c., Chicago, though some sellers, in meeting competitors who are still delivering steel against contracts at 1.90c., are shading the local market at least $1 a ton. This concession is usually made on attractive tonnages when prompt delivery is not insisted upon.

Mill prices on plates per lb.: 2.00c., base Chicago.

Structural Awards.—Notwithstanding that awards are normal for this time of the year and that shops are in a fair position in the matter of backlogs, there is still a scramble to take small fill-in orders, and the result is that such business is now bringing no better prices than fabricators have recently obtained on tonnages running well above 1000 tons each. Of special note this week is the award by the Chicago & North Western of 6000 tons of bridge work, of which 5400 tons went to the American Bridge Co. and 600 tons to the Clinton Bridge Works, Clinton, Iowa. Steel for the first 14 stories of the Palmolive-Peet Co. Building, Chicago, has been definitely awarded to the American Bridge Co. This was previously reported as having been taken by an unnamed bidder. The American Bridge Co. has also taken 1100 tons for the Chicago Motor Club Building. New projects include 3000 tons for a 24-story apartment building and 1000 tons for an office building at La Salle and Lake Streets, Chicago. New orders for structural material are in excess of shipments and deliveries have been pushed ahead to an average of five weeks.

Mill prices on plain material per lb.: 2.00c., base, Chicago

Bars.—A gage of activity among local manufacturers is clearly given by the current demand for soft steel bars. For the third week sales have topped shipments and specifications have come in at such a rate that deliveries have been extended a week. Forgers, whose business is largely tied in with the automobile trade, are unusually busy, but they are cautious in placing orders for only such quantities of steel as will cover their actual scheduled requirements. There is no indication of a change in the rate of demand by farm implement manufacturers, and automobile builders continue to operate at a pace that in many instances is ahead of a year ago. Because of longer deliveries on steel products and the outlook in the automotive field, parts makers are scheduling their May and early June steel requirements. This market is quotable at 2c., Chicago, though irregularities to the extent of $1 a ton are reported. Iron bar prices are steady at 2c, New business in iron bars is light, but specifications against old business are of fair size. New buying in alloy steel bars is more active and makers now have the heaviest orders since the first of the year. Specifications are large, affording production at full capacity of local mills. New orders for rail steel bars are at close range. Specifications continue to run ahead of shipments, but the margin is small and deliveries are satisfactory, the range being 10 days to two weeks. Barn equipment manufacturers remain busy, but the bed industry is settling to a slower pace. Prices of rail steel are steady at 1.85c., Chicago district mills.

Mill prices per lb.: Soft steel bars, 2.00c. base, Chicago; common bar iron, 2.00c., base, Chicago; rail steel bars, 1.80c. to 1.85c., base, Chicago Heights mill.

Wire Products.—Recession in orders noted a week ago has been checked and shipments from local wire mills represent about 72 per cent of capacity. Heavy rains in rural districts are putting roads in bad condition and thus are slowing distribution. A bright spot appears in the market, however, by a sharp upturn in demand from the Northwest, where the spring trade is now swinging into a better stride. There is also a better tone to the nail market. Over-expanded stocks in the hands of jobbers appear now to have been reduced to the point where new orders are being sent to mills. It is conceded by the trade that the peak of the spring demand is passed. Specifications for wire from the manufacturing trade are heavy. Prices for wire and wire products are given on page 1039.

Rails and Track Supplies.—New orders for standard-section rails total 17,000 tons. The bulk of this tonnage, or 13,800 tons, represents the secondary requirements of the Burlington, which awarded 7500 tons to the Illinois Steel Co., 3800 tons to the Inland Steel Co. and 2500 tons to the Colorado Fuel & Iron Co. Miscellaneous track accessory business totals 4000 tons, while inquiry now before the trade is for not less than 15,000 tons. Although local mills are heavily engaged, shipping schedules are well arranged and there is little or no complaint as to deliveries.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Sheets.—This market is very quiet except in blue annealed sheets in the heavier gages. Demand for black and galvanized sheets is slack, and the none too heavy backlogs of local mills are rapidly being cut down. Prices in and close to Chicago are holding, but in outlying districts and in the Southwest concessions are being offered freely. Backlogs of blue annealed sheets average four weeks rolling, while in black and galvanized the average is less than two weeks.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.05c.; No. 24 galvanized, 3.90c.; No. 10 blue annealed, 2.25c. to 2.35c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Sheet Bars and Billets.—Prices are steady. New business is fully equal to shipments.

Hot-Rolled Strip.—Local mills are operating at capacity. New business is being taken at the full schedule.

Cast Iron Pipe.—Although this market is only moderately active, such business as has been taken clearly indicates that prices are strengthening. James B. Clow & Sons have taken 450 tons of 4 to 10-in. pipe for Oshkosh, Wis., at $29, Birmingham. Miscellaneous orders for carloads are being taken at $31. The only fresh inquiry of note comes from Oak Park, Ill., for 330 tons of 6 to 12-in. class B pipe. Public utilities have ordered a few scattered lots and several Western railroads are inquiring for carloads. Sellers have booked a fair tonnage from contractors. Several public projects are in the making.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $36.20 to $39.20; 4-in., $40.20 to $43.20; Class A and gas pipe, $4 extra.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.20c. to 2.55c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.

	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb.	$3.20
Common wire nails, base per keg	3.00
Cement coated nails, base per keg	2.90

Reinforcing Bars.—Fresh inquiry in this market bulks large, and includes 5000 tons of bars needed for a sewage project at Stickney, Ill., a suburb of Chicago. The Central Engineering Co. has ordered 400 tons of rail steel bars for Illinois State road work. Sellers of this commodity have submitted figures on 4000 tons of road work, of which fully 2000 tons may be closed in the coming week. Ground has been broken for the Edgewater Athletic Club, this being an old project which will take close to 1200 tons of bars. New estimates now being made on the Chicago *Daily News* Building may cut the reinforcing bar requirements to slightly less than 1000 tons. Prices for bars made of billet stock are irregular. Hard steel bars are strong at 1.85c., Chicago Heights mills. New awards and fresh inquiry are shown on page 1055.

Old Material.—The Chicago scrap market is lacking in interest. Brokers are busy filling old contracts and the larger consumers, having made heavy purchases, are now content to stay out of the market and let recent purchases care for immediate needs. A melter has bought 1000 tons of cast iron borings at $10 a gross ton, delivered, 25c. above recent quotations. Dealers are offering $9.75 for this grade. Early in the week forged wheels were sold to a user at $15.50 a gross ton, delivered, an advance of 50c. a ton. By the end of the week, however, prices had settled back to $15. The movement of scrap is heavy and railroad shipments are prompt. Country scrap is coming in at a more rapid rate and manufacturers scrap is being offered in large quantities.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.50 to $13.00
Shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart, and miscellaneous rails	13.00 to 13.50
Hydraulic compressed sheets	11.00 to 11.50
Drop forge flashings	9.50 to 10.00
Forged, cast and rolled steel car-wheels	14.50 to 15.00
Railroad tires, charging box size	16.25 to 16.75
Railroad leaf springs, cut apart	16.25 to 16.75
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.50 to 14.00
Coil springs	16.00 to 16.50
Electric Furnace Grades:	
Axle turnings	12.75 to 13.25
Low phosphorus punchings	14.00 to 14.50
Low phosphorus plate, 12 in. and under	13.75 to 14.25
Blast Furnace Grades:	
Axle turnings	10.00 to 10.50
Cast iron borings	9.50 to 10.00
Short shoveling turnings	9.50 to 10.00
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	14.00 to 14.50
Rerolling rails	13.75 to 14.25
Cupola Grades:	
Steel rails less than 3 ft	15.00 to 15.50
Angle bars, steel	13.75 to 14.25
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Railroad	12.75 to 13.25
Agricultural	12.00 to 12.50
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	18.75 to 19.25
Iron car axles	21.50 to 22.00
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 2 busheling	5.00 to 5.50
Locomotive tires, smooth	12.50 to 13.00
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.00 to 14.50
No. 1 railroad cast	12.50 to 13.00
No. 1 agricultural cast	12.50 to 13.00
Stove plate	11.25 to 11.75
Grate bars	11.00 to 11.50
Brake shoes	11.00 to 11.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Rogers Brown & Crocker Brothers, Inc., seller of pig iron, ferroalloys and coke, has moved its New York offices from the seventeenth to the thirteenth floor of the building at 21 East Fortieth Street.

Philadelphia

Sheet Prices Lower—Warehouses Establish Quantity Differentials on Sheets

PHILADELPHIA, April 9.—Black, galvanized and blue annealed sheet prices are weaker, and quotations range from 2c. to 2.10c., Pittsburgh, on blue annealed, 2.75c. to 2.90c. on black and 3.70c. to 3.75c. on galvanized. One maker has announced these reductions on blue annealed and black sheets and has reduced second quarter contracts accordingly. Plates and bars continue firm, but there is only a small volume of current buying at 1.90c. per lb., Pittsburgh, on bars and 2.05c., Coatesville, on plates. Shapes are quoted at 2c., Bethlehem, both on effective contracts and new business and uncompleted first quarter contracts have been rather generally extended through the present month.

Although new business is limited to small tonnages of plates, shapes and bars, mills are receiving a fair volume of specifications against contracts and operations continue at 60 to 65 per cent of capacity in this district. Bridge projects are the outstanding feature of the structural steel market. Prices for fabricated material are still at a low level.

Local warehouses have revised quotations on black and galvanized sheets and have established quantity differentials, extras being applied on orders for 10 to 50 bundles and on less than 10 bundles.

Pig Iron.—Foundry consumers in this district are reported to be melting more iron than in several weeks, but purchasing is still limited to carload lots. Prices, however, are being maintained at $20 per ton, base, for foundry iron. Low phosphorus is unchanged. The Washington Navy Yard will open bids April 14 on 357 tons of low phosphorus, and the Lorain Steel Co. is inquiring for about 1000 tons. The Brooklyn Navy Yard is in the market for 95 tons of No. 3 foundry iron. No sales of basic are reported.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26
East. Pa. No. 1X	21.76
Basic (delivered eastern Pa.)	$19.50 to 20.00
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	24.54 to 25.04
Virginia No. 2X, 2.25 to 2.75 sil.	25.04 to 25.54

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars.—Prices are firm and mills seem to be in a satisfactory position, with a steady flow of specifications against contracts. For current delivery, orders are small and 1.90c., Pittsburgh, is being maintained. Contract shipments are at 1.85c., Pittsburgh, or 2.17c., delivered Philadelphia. In some cases extensions of first quarter commitments have been granted, so that some tonnage is still moving at 1.80c., Pittsburgh.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, 3/16-in.	2.80c. to 3.00c.
Structural shapes	2.40c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.50c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.35c.
Cold-finished steel, squares and flats	3.85c.
Steel hoops	3.60c.
Steel bands, No. 12 gage to ⅛-in., inclusive	3.35c.
Spring steel	5.00c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.75c.
Blue annealed sheets (No. 10)	3.15c.
Diamond pattern floor plates—	
¼-in.	5.30c.
3/16-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

Shapes.—Quotations on new business and shipments on second quarter contracts are at 2c., Bethlehem, or 2.13c., delivered Philadelphia, and some first quarter contracts at 1.95c., Bethlehem, or 2.08c., Philadelphia, have been extended through the present month. The New York Central Railroad has revived an inquiry for 10 steel barges to be constructed of 12-in. channels. The Tacony-Palmyra bridge has been awarded to the American Bridge Co.

Plates.—The market ranges from 2c. to 2.05c., Coatesville, or 2.10c. to 2.15c., delivered Philadelphia, with some uncompleted contracts carried over at 1.95c., Coatesville, or 2.05c., Philadelphia. Mills are fairly well booked with business, and some additional tonnage may be in prospect if Delaware River shipyards obtain the Pennsylvania Railroad contract for 10 steel barges and carfloats, including a tugboat hull.

Sheets.—Blue annealed and black sheet prices seem to be definitely lower, with most mills offering concessions from 2.90c., Pittsburgh, on black, and 2.10c., Pittsburgh, on blue annealed; one producer of both grades is quoting 2c., Pittsburgh, for blue annealed and 2.75c., Pittsburgh, for black, having reduced second quarter contract prices to the new bases. Galvanized sheets are nominally 3.75c. per lb., Pittsburgh, but concessions of $1 a ton are not uncommon.

Warehouse Business.—Effective April 9, jobbers in this district have established quantity differentials on black and galvanized sheets. Base prices have been revised to 3.75c. per lb. on black and 4.75c. on galvanized, the base price applying on purchases of 50 bundles or more, a bundle ranging from 140 to 150 lb., depending upon the gage and size. For 10 to 49 bundles there is an extra charge of ½c. per lb., and on orders for less than 10 bundles the extra is 1c. per lb. There is an additional charge of 1c. per lb., or 2c. per lb. over base for broken bundles.

Imports.—In the week ended April 7, 2000 tons of pig iron arrived at this port from the United Kingdom. Ore imports consisted of 226 tons of chrome ore from Portuguese Africa. Steel arrivals were 339 tons of shapes, 24 tons of steel bars, 51 tons of steel skelp and 5 tons of hoops from Belgium; 21 tons of shapes and 15 tons of steel bars from Germany and 22 tons of galvanized strip steel from the United Kingdom. Steel scrap arrivals totaled 107 tons, of which 85 tons were from Germany and 22 tons from the United Kingdom.

Old Material.—Prices of most grades show little change, but demand is light, and there is a downward trend to prices. On the Pennsylvania Railroad list of about 40,000 tons of material the heavy melting steel and rails, about 20,000 tons, are reported to have gone to a large Eastern broker, who bid for delivery at Midland, Pa. The Carnegie Steel Co., Pittsburgh, is reported to have taken about 9000 tons of No. 1 steel and old rails on the Baltimore & Ohio list at $15.35 per ton, delivered Munhall, Pa. A Harrisburg consumer has purchased a tonnage of stove plate at $12 per ton, delivered, and heavy breakable cast at $15.50 per ton, delivered. Specification pipe has been sold to a Columbia, Pa., user at $12 per ton, delivered.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.50 to $14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.00 to 11.50
No. 1 railroad wrought	14.50 to 15.00
Bundled sheets (for steel works)	10.50
Machine shop turnings (for steel works)	10.50
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for steel works and rolling mill)	10.50 to 11.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	12.00 to 12.50
Stove plate (for steel works)	12.00
No. 1 low phos., heavy, 0.04 per cent and under	17.50 to 18.00
Couplers and knuckles	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
No. 1 blast furnace scrap	10.50 to 11.00
Machine shop turnings (for rolling mill)	11.00 to 11.25
Wrought iron and soft steel pipes and tubes (new specifications)	12.00 to 12.50
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 11.50
Steel rails for rolling	14.75 to 15.25
Cast iron carwheels	15.50 to 16.00
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	14.50 to 15.00

New York

Pig Iron Activity Subsides—Heavy Steel Pipe Specifications

NEW YORK, April 10.—Activity has subsided in the pig iron market, and new inquiries are confined mainly to relatively small tonnages. Sales by local brokers during the week totaled 7000 tons, a decline of about 3000 tons from the figure for the previous week. The Worthington Pump & Machinery Corporation, New York, has closed against its inquiry for 1250 tons for various plants. The American Locomotive Co., New York, has placed 500 tons of foundry for its Schenectady, N. Y., works. The General Electric Co. has entered the market for 400 tons of high silicon foundry for delivery at Schenectady during the current quarter. Prices are substantially unchanged. The Colonial Iron Co. furnace, Riddlesburg, Pa., was scheduled to go out for relining today. It has operated on the present lining for four years. The Danish steamer Kirsten Maersk, with a cargo of 3100 tons of Dutch iron, arrived at Bridgeport, Conn., April 7. The iron, which was consigned to Pilling & Co., New York, was unloaded at the T. A. D. Jones Coal Corporation docks. Part of the tonnage was sold prior to its arrival. The shipment is chiefly of interest because of the selection of Bridgeport as an unloading point, instead of Boston, New York or Philadelphia.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	20.89 to 23.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.39 to 23.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Finished Steel.—The chief development of the week has been in connection with merchant pipe, on which all producers announced an advance on April 2 and 3. Distributers were given one week in which to specify at the former prices. Some mills gave the privilege of specifying 60 days' requirements, while others held to 30 days' supply. The result was that orders for pipe during the past week have been very large. In other steel products, except sheets, which have weakened in price, conditions are unchanged. Prices on plates, shapes and bars are holding at the second quarter contract levels, namely 1.85c., Pittsburgh, on bars, 2c., Coatesville, on plates and 2c., Bethlehem, on shapes. Quotations $1 higher remain in effect, but are applying mostly on small lots from consumers not covered by contract. Buying against second quarter prices has not yet taken place to any extent because of the large specifications in the last week of March on expiring first quarter contracts. Shipments against these specifications will keep most consumers well supplied this month at least. Demand for structural steel in this market is enlarged considerably by the inquiry for 17,000 tons for the Reynolds Building, Lexington Avenue and Forty-second Street. The Structural Steel Board of Trade of New York reports total March bookings by its members at 32,200 tons—8200 tons larger than February contracts, but 5800 tons less than the total for March, 1927.

Mill prices per lb., delivered New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.17½c. to 2.22½c.; structural shapes, 2.14½c. to 2.19½c.; bar iron, 2.14c.

Warehouse Business.—There is a good volume of purchasing of structural material, and other products are moderately active. Most jobbers report April business as large as March's and in some cases, should present activity continue to the end of the month, it will exceed that of last month. The new quantity differentials are being maintained.

Cast Iron Pipe.—Purchasing of bell and spigot pipe is light. Delivered prices of Northern foundries continue lower than Birmingham makers are willing to meet. The largest current inquiry in this district is 2700 tons of 4, 6, 8, 10, 12, 16 and 20-in. water pipe for New York City, bids on which will be opened April 17. New York City is also in the market for about 200 tons of high pressure pipe. Jersey City, N. J., has closed on 175 tons of 8-in. water pipe with the United States Cast Iron Pipe & Foundry Co.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $36.25 to $37.25; 4-in. and 5-in., $41.25 to $42.25; 3-in., $51.25 to $52.25; Class A and gas pipe, $4 to $5 extra.

Reinforcing Bars.—Lettings during the last week have been few and in small tonnages. Several hundred tons will be required in a number of road contracts in New Jersey, few of which have yet been placed. Distributers continue to quote 2c., Pittsburgh, on new business, but few projects large enough to test the price have come out recently. New York and Youngstown warehouse prices are unchanged.

Coke.—Buying of both foundry and furnace grades continues light. Connellsville furnace coke is quoted at about $2.75 per ton, Connellsville, for standard grade. Delivered prices on beehive foundry coke are: To northern New Jersey, Jersey City and Newark, $8.71 to $8.81 per net ton; to New York and Brooklyn, $9.59 to $9.69 per net ton. By-product coke is quoted at $9 to $9.40

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars and small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-rolled strip, soft and quarter hard,	5.15c. to 5.40c.
Hoops	4.50c.
Bands	4.00c.
Blue annealed sheets (No. 10 gage)	3.90c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	5	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c. to 4.00c.
No. 22	3.95c. to 4.15c.
No. 24	4.00c. to 4.20c.
No. 26	4.10c. to 4.30c.
No. 28*	4.25c. to 4.45c.
No. 30	4.50c. to 4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c.
No. 16	4.45c.
No. 18	4.35c. to 4.60c.
No. 20	4.50c. to 4.75c.
No. 22	4.55c. to 4.80c.
No. 24	4.70c. to 4.95c.
No. 26	4.95c. to 5.20c.
No. 28*	5.20c. to 5.45c.
No. 30	5.60c. to 5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

per net ton, Newark or Jersey City, N. J., and $10.06 to $10.29 per ton, New York or Brooklyn.

Old Material.—Prices of most grades of scrap still show a downward tendency. No. 1 heavy melting steel is unchanged at $13.50 per ton, delivered eastern Pennsylvania, and a good tonnage is moving to the larger consumers. Stove plate is being purchased by brokers at $11.50 to $12 per ton, delivered, the lower quotation being for delivery to a Harrisburg consumer. Specification pipe has been purchased at $12 per ton, delivered Columbia, Pa., and brokers are offering $11.50 per ton for that delivery. The heavy melting steel and old rails on the Pennsylvania Railroad list, a total of close to 20,000 tons, are understood to have gone to Midland, Pa., at $15.96 per ton, delivered.

Dealers' buying prices per gross ton f.o.b. New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	6.75 to 7.25
No. 1 heavy breakable cast	11.25 to 12.00
Stove plate (steel works)	7.75 to 8.00
Locomotive grate bars	8.00 to 8.50
Machine shop turnings	6.50 to 7.25
Short shoveling turnings	6.50 to 7.25
Cast borings (blast furnace or steel works)	6.25 to 7.25
Mixed borings and turnings	6.50 to 7.25
Steel car axles	15.50 to 16.00
Iron car axles	23.75 to 24.75
Iron and steel pipe (1 in. dia., not under 2 ft. long)	7.75 to 8.25
Forge fire	6.75 to 7.00
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought, long	8.50 to 9.00
Rails for rolling	10.00 to 10.50
Cast iron carwheels	10.75 to 11.25
Stove plate (foundry)	8.50 to 9.00
Malleable cast (railroad)	10.00
Cast borings (chemical)	11.00 to 11.50

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$13.75 to $14.25
No. 1 heavy cast (columns, building materials, etc.), cupola size	11.75 to 12.25
No. 2 cast (radiators, cast boilers, etc.)	11.25 to 11.75

Cleveland

Auto Body Sheets Decline $3 a Ton—Other Grades Weaker

CLEVELAND, April 10.—Mills took a good volume of business the past week, although a lull after the heavy specifications of the previous week against expiring 1.80c. contracts for steel bars, plates and structural shapes would not have caused surprise. Mills have a large tonnage in orders entered at the end of the month that will be shipped at their convenience this month.

Orders received from the automotive industry indicate that it will take more steel this month than in March. Optimistic reports continue to come from the motor car manufacturers, and it is predicted that the seasonal slowing down in this industry this year will not start until a month later than last year. One manufacturer of medium-priced cars is curtailing shipping orders with a view of discontinuing its present line and bringing out new models.

Operations in industries outside of the automotive field show an upward trend. On current orders, the market is established at 1.85c., Pittsburgh, for bars, plates and structural material, at which most consumers have placed contracts. The 1.90c. price is maintained for small miscellaneous lots. Some inquiry for contracts is coming from very small-lot buyers who evidently hope to get advantage of the minimum price by making contracts. Local mills quote steel bars at 1.85c., Cleveland.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.60c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

Attempts to get higher prices than prevailed last quarter for sheet bars and strip steel have met sharp resistance from the automotive industry in Detroit, and auto body sheets have declined $3 a ton to the first quarter price. Prices on cold-rolled strip to large buyers show a wavering tendency. The lull in structural steel lettings in this territory continues.

Pig Iron.—The market was fairly active the past week, although the sales of foundry iron by Cleveland interests, amounting to 26,000 tons, showed a sharp falling off from the previous week. Activity was well distributed among Ohio, Michigan and Indiana territories. Prices are holding fairly steady at recent quotations. The ruling Lake furnace price is $17, except for shipment to the more competitive points in southern Ohio, where Lake furnaces are quoting $16.75, with reports indicating that this price is being shaded. In Michigan the market is firm at $18. With the approach of Lake navigation, some activity is looked for in water shipments. The sale of a small tonnage of iron for shipment from Cleveland to Milwaukee is reported, and some inquiry has developed at Cleveland for boat shipment to Detroit. Last year producers were able to get a rate as low as $1.50 a ton for water shipment from Cleveland to Chicago, including handling charges at each end. Shipping orders indicate that shipments during April will show a slight gain over March. The automotive industry is taking as much iron as last month, but a slowing down in the demand from this source would not be surprising next month, as some of the automobile companies are not expected to keep up their present production schedules through May. The foundry melt outside of the automotive industry shows a slight gain. Conditions in the industries making various types of heating equipment are reported to show an improvement.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.50
Southern fdy., sil. 1.75 to 2.25	22.00
Malleable	18.50
Ohio silvery, 8 per cent	28.00
Basic, Valley furnace	17.00
Standard low phos., Valley furnace	$26.50 to 27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Iron Ore.—Iron ore producers are awaiting action of the Ford Motor Co. on their bids submitted April 3 for 440,000 tons of Lake Superior ore. Some other business will be closed as soon as prices are named. Nothing has developed to change the belief that last season's prices will be reestablished.

Iron Ore Stocks.—The dock balance of Lake Superior ore at Lake Erie ports April 1 was 5,568,098 tons, compared with 5,239,687 tons on the same date a year ago. Shipments from docks are light, amounting to 426,008 tons in March, compared with 830,826 tons during the same month last year.

Coke.—By-product foundry coke has been reduced 25c. a ton to $7.75, Painesville. This coke is now $8.76, delivered Cleveland, compared with $8.77 for Ashland coke, which was recently reduced 50c. a ton. Heating coke is weak, with a range of from $2.50 to $2.75. Connellsville foundry coke is unchanged at $3.75 to $5.10. By-product coke for domestic use is moving very slowly.

Semi-Finished Steel.—Specifications continue heavy against second quarter contracts, and while there are reports of concessions, the market appears to be holding closely to $33, Cleveland, for sheet bars, billets and slabs. The leading local producer is still operating at 100 per cent of capacity.

Wire Products.—Nails are moving somewhat better than recently and the $2.65 price appears firm in northern Ohio, but in the central and southern sections of the State $2.55 is still rather commonly quoted.

Reinforcing Bars.—A fair amount of new work is coming out in small lots, but no large lettings have been made recently. Prices on stock orders are irregular. Rail steel bars are unchanged at 1.75c., mill.

Warehouse Business.—Sales are fairly heavy and prices are well maintained. Galvanized sheets are moving rather slowly, but a seasonal demand is expected to stimulate orders shortly.

Sheets.—Auto body sheets have declined $3 a ton to 4c., Pittsburgh, or the same price at which consumers covered late in the year for the first quarter. Strong effort was made by some of the leading producers to maintain the 4.15c. price, at which a moderate amount of business had been placed recently by the automotive industry, but a price break developed in the Detroit market. Weakness has also appeared in blue annealed sheets, which had been holding rather firmly to 2.10c., Pittsburgh. On these a 2c. price has become rather common. Black sheets, which have been irregular for some time, have settled down to 2.75c. to 2.85c., Pittsburgh, and little effort is being made now to get 2.90c. Galvanized sheets are unchanged at 3.65c., Pittsburgh. Demand in this territory is not active but orders from the automotive industry in Michigan continue heavy.

Strip Steel.—Some contracts have been taken at $1 to $3 a ton above those at which larger consumers covered for the first quarter, but somewhat lower than current market quotations. Small lots are moving at regular prices. On cold-rolled strip, concessions of $3 a ton to 2.75c., Cleveland and Pittsburgh, for 3 tons and over have appeared in the Detroit territory, although some business is reported to have been placed by automobile manufacturers at regular prices. The reduction on auto body sheets is expected to have an effect on cold-rolled strip prices.

Bolts, Nuts and Rivets.—Bolt and nut specifications are fair, the volume being about the same as during last month. Orders are heavy from the automotive industry, but only fair from jobbers. Prices are firm. The demand for rivets shows some gain. All specifications for large rivets are now against the new $2.90 per 100 lb. contracts, or $3 a ton above the price that prevailed during the first quarter.

Fluorspar.—Leading producers on April 9 advanced gravel fluorspar $1 a ton to $16 at mines. This price will be quoted for the last half, although most large consumers are covered for that delivery. A few car lot sales were made during the week at $15.

Old Material.—The purchase of a round tonnage of heavy melting steel and compressed sheet scrap by the American Steel & Wire Co., reported last week, failed to add strength to the local market. No additional demand has developed from consumers, and dealers are not buying because they already have purchased considerable scrap which they cannot release for shipment. Steel making scrap has again begun to move by water from Detroit to Cleveland. These shipments are against a 20,000-ton contract placed by a Cleveland mill with a Detroit dealer late last year. Machine shop turnings have declined $1 a ton. As there is no local demand, an out-of-town market must be found for this grade.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.75 to $14.00
No. 2 heavy melting steel	13.25 to 13.50
Compressed sheet steel	12.75 to 13.00
Light bundled sheet stampings	11.50 to 11.75
Drop forge flashings	12.00 to 12.50
Machine shop turnings	8.00 to 8.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 14.00
No. 1 busheling	11.00 to 11.25
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet, bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.00 to 10.25
Mixed borings and short turnings	10.00 to 10.25
No. 2 busheling	10.00 to 10.25
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

J. O. Henshaw, dealer in pig iron and coke, Boston, has removed his office from 79 Milk Street, to 540 Oliver Building, 141 Milk Street.

San Francisco

Building Permits in Coast Cities Gain —Lull in Demand for Steel

SAN FRANCISCO, April 6, (*By Air Mail*).—Little or no improvement in demand for steel products developed during the past week. Bookings were not heavy. The largest lettings involved 800 tons of plates for three lightships for the Government at Portland, placed with the Albina Marine Engine Works, 650 tons of reinforcing bars for Los Angeles, booked by the Blue Diamond Co., and 650 tons of structural shapes for school buildings at Glendale, Cal., taken by the Llewellyn Iron Works.

Building permits issued in the larger cities on the Coast during the past month were, on the whole, slightly in excess of the total for March, 1927. Portland permits numbered 970, with an estimated valuation of $2,907,880. At Seattle, permits aggregated $4,273,490, compared with $3,492,610 for the same period last year. During the first quarter permits set a new high record, being nearly $5,000,000 greater than the first quarter of last year. The totals were $11,092,815 as against $7,345,745.

Pig Iron.—Foundry operations continue at about the level that has prevailed during the past three or four months. Sales and inquiries for pig iron are confined to unimportant lots. A shipment of 850 tons of Indian iron will arrive on the Coast next week. Another lot of 1400 tons is due to arrive the latter part of this month or early in May. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—Most reinforcing bar bookings call for lots ranging from 20 to 60 tons. Two hundred tons for the Stimson Building, Seattle, was placed with an unnamed interest. Other business included 120 tons for a bridge at Riverside, Cal., and 110 tons for a produce building in San Francisco. Pending business calls for more than 13,000 tons. Bids have been opened on 5200 tons for a drainage improvement project in Los Angeles. Out-of-stock prices in the bay district continue weak and 2.25c. is frequently quoted.

Plates.—In addition to the 800 tons for lightships at Portland, mentioned above, the Government has placed 250 tons for Mare Island and 500 tons for Mare Island and Puget Sound Navy Yards with unnamed Eastern interests. Demand generally is light. Siphons for the Yakima project in Washington for the United States Bureau of Reclamation call for 450 tons. Prices appear firm at 2.30c., c.i.f.

Shapes.—Structural shape bookings fell off this week, and the total, 850 tons, was smaller than for any week so far this year. The California Steel Co. took 200 tons for an office building at Reno, Nev. Bids were opened this week on 600 tons for a bridge over the Smith River, Del Norte County, Cal., and on 250 tons for a hangar at Oakland. The McClintic-Marshall Co. was low bidder on 150 tons for Los Angeles. Pending business exceeds 11,000 tons. Plain material remains firm at 2.35c., c.i.f.

Cast Iron Pipe.—A slight falling off in demand for cast iron pipe is reported. Awards this week totaled over 1000 tons. George H. Oswald, Los Angeles, took 181 tons of 6 and 8-in. class B for the improvement of Foothill Boulevard, Azusa, Cal. Aberdeen, Wash., placed 53 tons of Universal pipe with the Central Foundry Co. and 105 tons of 6 and 8-in. class 15 with the Pacific States Cast Iron Pipe Co., Vancouver, B. C., awarded 500 tons to the American Cast Iron Pipe Co., Astoria, Ore., placed about 100 tons of 6-in. class C with an unnamed interest. The Pan-Pacific Construction Co., Los Angeles, took 148 tons of 8 and 18-in. class B for the improvement of Hermosa Avenue, Her-

(*Concluded on page* 1055)

Boston

Prices on Reinforcing Bars and Structural Steel Shapes Are Easier

BOSTON, April 10.—Pig iron sales the past week were small. A fair tonnage of Alabama iron was sold notwithstanding its higher cost on a delivered basis. Buffalo No. 2 plain iron, on an all-rail freight rate basis, is still available at $16 a ton, furnace, regardless of the tonnage involved or date of delivery, and New York State furnaces and the Mystic Iron Works are endeavoring to meet that price. Interest centers in the new rail-and-water rates from the Buffalo district to New England to be put into effect by the New York, New Haven & Hartford Railroad on April 21. The water rate from Buffalo to Beacon, N. Y., is $1.50 per ton and there is a loading charge of 28c. per ton. The rail rate from Beacon to Brockton, Fall River, Milford, New Bedford, Newton Upper Falls, Somerset, Taunton, Walpole and Whitman, all in Massachusetts, is $2.50 a ton, and to all other New England consuming points $2, so that Buffalo iron will carry a freight rate of $3.78 to $4.28 a ton, instead of the prevailing all-rail rate of $4.91. The Champlain stacks can, it is understood, take advantage of the new water-and-rail rates, but the saving to most New England points will be small, if any. The new rates place the Mystic Iron Works at a disadvantage at most consuming points. To illustrate, the new Buffalo rate to Whitinsville, Mass., is $3.78, while the Mystic rate is $2, with a switching charge of $5 per car. In contrast, the Mystic rate to Westfield, Mass., is $2.39 per ton, while the new Buffalo rate is $3.78.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$20.91 to $21.91
Buffalo, sil. 2.25 to 2.75	21.41 to 22.41
East. Penn., sil. 1.75 to 2.25	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75	23.65 to 24.15
Virginia, sil. 1.75 to 2.25	25.71
Virginia, sil. 2.25 to 2.75	26.21
Alabama, sil. 1.75 to 2.25	22.91 to 24.77
Alabama, sil. 2.25 to 2.75	23.41 to 25.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Cast Iron Pipe.—Boston has closed bids on 550 tons of 24-in. pipe. R. D. Wood & Co. were the low bidders, but no award has been made. Everett, Mass., has closed bids on 200 tons of pipe, on which the Warren Pipe & Foundry Co. was low bidder, but no award has been made. No award has been made by Winthrop, Mass., on 200 tons of 8-in. pipe, bids for which closed April 5, but Quincy, Mass., has awarded 300 tons of 4, 6, 8 and 14-in. pipe to the Warren Pipe & Foundry Co. Wellesley, Mass., closed bids April 9 on 200 tons of 6, 8 and 12-in. pipe. Current business is on a basis of $39.10 a ton, delivered common Boston freight rate points for 6 to 12-in. pipe and at $44.10 for 4-in. On large sizes, however, concessions are being made. The usual $5 differential is asked on class A and gas pipe.

Coke.—Connecticut foundries are ordering in by-product foundry coke more actively than a month ago, indicating an increase in the melt, but in other New England States there is little improvement. New England producers of this fuel quote $11 a ton, delivered within a $3.10 freight rate zone. A decided slump in demand for domestic by-product coke is reported. Domestic fuel sells on a basis of $8 a ton on cars at ovens, Everett, Mass.

Warehouse Business.—Warehouse business is spotty. Some concerns did a large business in March, but the showing by others was not as good. Current movement of iron and steel out of stock, in the aggregate, is only fair at best. Nails are in slightly better demand. Prices on all materials are firm and unchanged.

Cold-Rolled Strip.—Mill representatives report a noticeable letdown in bookings the last few days. The rollers are in a fairly comfortable position, however, previous second quarter bookings being substantial, and shipments on first quarter specifications extend into this month. The current quotation is 3.15c. per lb., base Pittsburgh. The Worcester, Mass., mill quotes 3.30c. per lb., base, on 1 to 3 ton lots.

Bars.—Current buying of reinforcing bars continues in small tonnages. Competition for business is keener and even small lots sold the past week at 1.85c. to 1.90c., per lb., base Pittsburgh, as compared with 1.90c. to 1.95c. two weeks ago.

Shapes and Plates.—Mill bookings of standard shapes have been comparatively small the past week. While 1.90c. per lb., base Pittsburgh, is openly quoted, some business has been placed at 1.85c. Fabricators report a slight improvement in prospective business, mostly in small individual tonnages. Plates are in moderate demand at 1.90c. per lb., base Pittsburgh.

Importations.—Local importations of pig iron in March totaled 558 tons, made up of 159 tons of Dutch and the rest of Indian. Importations in February, this year, were 1215 tons. So far in April, 110 tons of Dutch iron has been landed here. In addition, 7042 tons of ore from Tunis has been received this month by the Mystic Iron Works.

Old Material.—Most grades of old material are moving in limited quantities. The lighter materials, such as steel turnings and forge scrap, have a better call than heavy melting steel. A fair tonnage of heavy cast was purchased at $10.50 to $11 a ton on cars, shipping point, and quite a little No. 2 machinery cast was shipped to the Pittsburgh district. Scattered cars of forge flashings were taken at $7.25 a ton on cars, but $7 appears to be the average top quotation. Machine shop turnings are moving better and bringing about 50c. a ton more than a week ago. Steel mill borings, on the other hand, are about that much easier. The Mystic Iron Works is still taking in stove plate at $10 a ton, delivered. New England foundries continue to supply their cast requirements from local or nearby yards and still show a preference for No. 1 machinery cast to textile machinery cast.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.00
Scrap T rails	$8.50 to 8.75
Scrap girder rails	7.50 to 8.00
No. 1 railroad wrought	9.50 to 10.00
No. 1 yard wrought	7.50 to 8.00
Machine shop turnings	5.50 to 6.00
Cast iron borings (steel works and rolling mill)	5.50 to 6.00
Bundled skeleton, long	5.75 to 6.25
Forge flashings	6.50 to 7.00
Blast furnace borings and turnings	5.75 to 6.00
Forged scrap	6.00 to 6.50
Shafting	13.00 to 13.50
Steel car axles	15.00 to 15.25
Wrought pipe (1 in. in diameter, over 2 ft. long)	7.50 to 8.00
Rails for rolling	10.00 to 10.25
Cast iron borings, chemical	9.50 to 10.00

Prices per gross ton delivered consumers' yards:

Textile cast	$13.50 to $14.00
No. 1 machinery cast	15.00 to 15.50
No. 2 machinery cast	13.00 to 13.50
Stove plate	10.00 to 10.50
Railroad malleable	13.00 to 13.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	*3.45c. to 5.45c.
Squares and flats	*3.95c. to 6.95c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

St. Louis

Steel Bookings Keep Granite City Mill Operating Full—Pig Iron Firmer

ST. LOUIS, April 10.—The pig iron market displayed increased activity this week, and prices are firmer largely because of the southern Illinois coal mine strike and the resultant possibility of higher prices for coal. The Granite City maker sold 12,000 tons, including 10,000 tons of basic to an East Side melter; 500 tons of foundry grades to a southern Illinois stove plant; 350 tons of foundry to an East Side melter, and 150 tons of foundry to a Kansas City company; also 250 tons of malleable to a Pacific Coast user and 150 tons of malleable to an Illinois melter. An inquiry is pending from a radiator company for 5000 tons of foundry iron, and there are several 300-ton inquiries.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	20.66
Southern No. 2 fdy., delivered	20.42
Northern malleable, delivered	20.66
Northern basic, delivered	20.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Iron and Steel.—Bookings for March by the Granite City Steel Co. were considerably in excess of production and shipments, although shipments were the largest for any month in the history of the company. The demand for tank plates is exceptionally heavy, and the company is in a very comfortable position with respect to unfilled tonnages of this item. Buying of black and blue annealed sheets and tin plate specifications have been sufficient to warrant 100 per cent operation of these mills. The demand for galvanized sheets continues to lag, and this department of the Granite City plant is operating 75 per cent of capacity, while the open-hearth department is at full capacity. The Missouri-Kansas-Texas and Wabash railroads have issued inquiries for second quarter requirements of plates, shapes and bars. The Missouri Pacific has asked for prices on 400 tons of plates, 200 tons blue annealed sheets, 10 tons black sheets, 75 tons locomotive jacket steel and 30 tons galvanized copper bearing sheets for second and third quarter requirements. Business with structural fabricators is dull. Warehouse business is fairly good in the St. Louis industrial district, but this is counteracted by a lack of orders from the oil fields.

Coke.—The leading by-product factor in the district has made new prices on domestic grades at $6.25 ovens for shipments out of town and $7.25 to dealers, and $10.50 to consumers delivered in St. Louis. The same factor's price for foundry coke is $9.75, delivered in St. Louis, and $9 ovens, for outside shipment. Buying is only fair.

Old Material.—The market for old material grows weaker, and prices again are off. Heavy shoveling and melting steel, No. 1 locomotive tires, No. 2 railroad wrought, No. 1 busheling and cast iron borings are 25c. a ton down; miscellaneous rails, railroad springs and machine shop turnings are 50c. lower, and steel car axles have declined $1. Mills are declining to buy until they have used up present stocks, and dealers are trading among themselves to take care of the few unfilled contracts. Railroad lists include: Louisville & Nashville, 14,135 tons; Santa Fe, 5860 tons; Wabash, 2305 tons; Missouri-Kansas-Texas, 2000 tons; Texas & Pacific, 570 tons; Kansas City Southern, 520 tons; Ann Arbor, 144 tons; Great Northern, 54 carloads; Chicago & Eastern Illinois, 20 carloads; Pullman Co., nine carloads.

Prices per gross ton, f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$10.75 to $11.25
No. 1 locomotive tires	12.00 to 12.50
Heavy shoveling steel	10.75 to 11.25
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	12.00 to 12.50
Railroad springs	13.00 to 13.50
Bundled sheets	8.75 to 9.25
No. 2 railroad wrought	10.75 to 11.25
No. 1 busheling	9.50 to 10.00
Cast iron borings	8.75 to 9.25
Iron rails	13.00 to 13.50
Rails for rolling	12.75 to 13.25
Machine shop turnings	6.50 to 7.00
Steel car axles	17.50 to 18.00
Iron car axles	23.50 to 24.00
Wrought iron bars and transoms	21.00 to 21.50
No. 1 railroad wrought	10.00 to 10.50
Steel rails, less than 3 ft	15.00 to 15.50
Steel angle bars	11.50 to 12.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	13.50 to 14.00
Railroad malleable	10.75 to 11.25
No. 1 railroad cast	13.00 to 13.50
Stove plate	12.50 to 13.00
Agricultural malleable	12.00 to 12.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galvanized sheets (No. 24)	5.25c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets (No. 24)	4.50c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.75c.
Boiler rivets	3.75c.

	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	70
Less than 100 lb	65
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, squares, blank or tapped, 200 lb. or more	60
Less than 200 lb	50
Hot-pressed nuts, hexagons, blank or tapped, 200 lb. or more	60
Less than 200 lb	50

Buffalo

Pig Iron Shipments Increase—Steel Operations Sustained

BUFFALO, April 10.—The General Electric Co. is in the market for 400 tons of foundry pig iron, an addition to the 2900 tons recently bought. A district consumer seeks 1000 tons of malleable, and a New York State consumer wants 500 tons of foundry. There is another inquiry of 700 to 800 tons of foundry. Several 100 to 300 ton lots of foundry and malleable have been taken by Buffalo furnaces at $17, base, for foundry and $17.50 for malleable. There has been a slight pickup in the melt, and shipments on orders are considerably better. The Hanna Furnace Co. has started tearing down the No. 4 Susquehanna stack preparatory to rebuilding it.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2 foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	$17.00 to 17.50
Basic	16.50 to 17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Most of the mills continue a high percentage of operation. The average is about 85 per cent. Bars, shapes and plates are strong at 1.95c. to 2c. Prices were increased 5 per cent on standard pipe during the week and specifications have been heavier. Bolt and nut prices show the same discounts for the second quarter as the first, and business is very good. An ice-skating rink, bids for which will be taken about April 20, will require 750 tons of structural steel. The reinforcing bar market has been devoid of important lettings.

Old Material.—Dealers report one of the quietest weeks in several months. New York Central, Erie,

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

Michigan Central and Pennsylvania railroad lists have been closed, but little of the scrap came to Buffalo. The heavy melting steel received here brought close to $15. Shipments are going to plants steadily. One Buffalo consumer has a large tonnage of scrap in Detroit which will begin to come in as soon as navigation opens. Short rails, 3-ft. and under, have been sold in small lots, bringing $16.25 to $17.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.50 to $15.00
No. 2 heavy melting steel	12.75 to 13.25
Scrap rails	13.75 to 14.25
Hydraulic compressed sheets	13.00 to 13.50
Hand bundled sheets	9.00 to 9.50
Drop forge flashings	12.00 to 12.50
No. 1 busheling	13.25 to 13.75
Heavy steel axle turnings	12.50 to 12.75
Machine shop turnings	8.25 to 8.75
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.50 to 16.00
Railroad coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
Low phosphorus billet and bloom ends	17.00 to 17.50
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.25
Blast Furnace Grades	
Short shoveling steel turnings	10.50 to 11.00
Short mixed borings and turnings	9.50 to 10.00
Cast iron borings	9.75 to 10.25
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades	
Steel car axles	17.00 to 17.50
Iron axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Cupola Grades	
No. 1 machinery cast	14.50 to 15.00
Stove plate	13.00 to 13.50
Locomotive grate bars	12.00 to 12.50
Steel rails, 3 ft. and under	16.50 to 17.00
Cast iron carwheels	13.00 to 13.50
Malleable Grades	
Railroad	15.00 to 15.25
Agricultural	15.00 to 15.25
Industrial	15.00 to 15.25

Birmingham

Pig Iron Shipments Heavy—Steel Demand Holds Up Well

BIRMINGHAM, April 10.—The pig iron market continues to move along quietly, with merchant producers gradually increasing bookings. Spot buying is holding up to the average of the past few weeks. The melt increased during the past week and shipments were heavier than for any previous week this year. Foundry iron quotations are still on a $16 base. The Woodward Iron Co. blew out furnace No. 1 at Woodward on March 31 for relining. Seventeen furnaces are now in blast—eight on foundry, seven on basic, one on recarburizing iron and one on ferromanganese.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil	$16.00
No. 1 foundry, 2.25 to 2.75 sil	16.50
Basic	15.00

Finished Steel.—Mills are finding a fairly steady demand, in line with market conditions of the past several weeks. No tonnage of any consequence is being booked by structural steel fabricators and concrete bar distriubuters. Open-hearth operations are the same, with the Tennessee company working 13 or 14 and the Gulf States Steel Co. four.

Cast Iron Pipe.—Pressure manufacturers report a good increase in tonnage during the past week. Makers in the district shared in a number of municipal orders, the larger ones being placed by Meridian, Miss., Kansas City, Mo., Evansville, Ind., Fort Wayne, Ind. and Milwaukee, Wis. Central Iron Foundry Co. was awarded 27,000 ft. of pipe by Tuscaloosa, Ala. Inquiries on municipal pipe indicate that a considerable portion of the usual spring tonnage is yet to be placed. Small order business continues to come in at a fair rate. Shipments have increased slightly. Base prices continue at $29 to $31.

Coke.—Practically all of the larger consumers have covered their second and third quarter requirements. A nominal amount of spot sales constitutes the only activity in the market. Shipments during the week showed a slight increase over the average for the past few weeks. No change has been made in prices.

Old Material.—There is no noticeable change in shipments or inquiries. Both continue at the low rate that has prevailed for the past several weeks. Prices are unchanged.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$9.50 to $10.00
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00
Stove plate	14.50
Steel axles	19.00 to 20.00
Iron axles	20.00 to 21.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	13.00
No. 1 cast	14.50
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.50 to 14.00

Pacific Northwest

Business Slightly Less Active but Prices Except on Sheets Are Firm

SEATTLE, April 7 (*By Air Mail*).—Inquiries and orders for steel products have slowed down in the past week or 10 days, with the single exception of reinforcing bars, these being quite active with large orders in sight, two of which, totaling about 2500 tons, are scheduled to be placed this week. Prices, except on sheets, are firm, and on steel pipe are higher. Building permits in Seattle for March were over $4,000,000, a record month.

Pig Iron.—Sales are only in small lots. Some foreign iron continues to come into this market. Utah basic and No. 2 foundry are quoted at $24 to $25, Seattle.

Plates.—The contract for the building of the penstock at Cedar River, taking 1550 tons, has been placed with the Puget Sound Machinery Co., Seattle, but the plates are not ordered. The United States Reclamation Service is asking bids on 500 to 1500 tons for work at Ellensburg, Wash. Plates remain firm at 2.30c., Seattle.

Structural Shapes.—Not much new work is in sight. Bids will be opened on April 24 for 1050 tons for a bridge at Kettle Falls, Wash. Another bridge at Quetts River, Wash., will take 650 tons, but bids have not been invited. About 500 tons of bridge work has been placed with a Southern fabricator. Shapes are quoted at 2.35c., Seattle.

Track Materials.—The Pacific Coast Railroad, an interest of the Pacific Coast Co., Seattle, is asking bids on 175 to 200 tons of 75-lb. rails, to be used in laying tracks at its new cement plant.

Reinforcing Bars.—Inquiry is active, and considerable work is being placed. The Pacific Northwest Rolling Mills, Inc., Seattle, has taken 400 tons for the Bolker warehouse here and about 240 tons to go in the new Stimson Building. State work of about 250 tons has been placed. The largest job in sight is the material for the Bon Marche Building, bids on which are in, and which will take 1800 tons or more. Reinforcing bars are more stable now than for some time. Quotations range from 2.20c. to 3c., depending on size and desirability of the order. State work on the market calls for about 300 tons.

Sheets.—Demand is only fair and prices are weaker. Current quotations are: No. 24 black, 3.50c.; No. 24 galvanized, 4.25c.; No. 10 blue annealed, 2.65c., all Seattle.

Warehouse Business.—A leading jobber reports that March was the best month his company has had in some time, but also states that the immediate outlook is not so good. Prices are firm, with the exception of sheets, which are weaker.

Warehouse Prices, f.o.b. Seattle

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Tees, bar sizes	3.25c.
Reinforcing bars	3.00c.
Blue annealed sheets (No. 10)	3.90c.
Black sheets (No. 24)	4.90c.
Galvanized sheets (No. 24)	5.65c.
Structural rivets, ½-in. and larger	5.50c.

Detroit

Automobile Production This Month Continues At High Rate of March

DETROIT, April 10.—There is no indication of an early change in automobile production from the peak activity which has characterized the operations in this industry for the past two months. In fact, March figures have indicated new high marks for several of the automobile companies.

The Ford Motor Co. has recently announced a production of 2000 cars a day, with a schedule of 5000 per day to be reached by July 1. The Ford company shipped 25,720 model A cars in March. Approximately 50,000 of these units have been built to date. Ford now has 15 assembly plants in full operation, in addition to the three large plants in this area, namely, Fordson, Highland Park and Lincoln. The Detroit plants are working 97,565 employees—64,379 at Fordson, 28,221 at Highland Park, and 4965 at Lincoln. The increase in Ford production is calculated to more than make up for any falling off in other quarters of the medium-priced field in the next three months.

Hudson-Essex shipped 91,500 units during the first quarter of this year, or about 1500 more than the estimate 30 days ago. This figure compares very favorably with that for 1927, which was 74,000.

Packard set up a new record, with 4428 units shipped during March, compared with 3366 units for the same month a year ago.

Hupp Motor Car Co. also established a new record, with 8034 units for the month. This was more than 1000 units above the estimated production 30 days ago. It compares with 4942 units for the same month in 1927. March production brings the total for the first quarter to 16,862 units, as against 11,803 in 1927. The Hupp Motor Car Co. entered the present month with 4000 unfilled orders.

Chevrolet completed March with 133,657 units, compared with 107,900 units for the same month a year ago, bringing the total for the first quarter to 342,184, or practically 75,000 units ahead of the first quarter of last year. The schedule for the current month contemplates 132,000 units.

Graham-Paige turned out 7623 units in March, bringing the total for the first quarter to 13,139.

Dodge production during March amounted to 26,895 cars and trucks, bringing the total for the first quarter to 60,387, compared with 46,566 in the first three months of 1927. April schedule contemplates a substantial increase over that of March. Approximately 6000 men have been added to the force of the Dodge Brothers plants since Jan. 1. The total now numbers 24,124.

Reo Motor Car Co. added a March production of 3549 cars and trucks—a substantial increase over February production of 2467 units. The Reo company entered April with 5000 unfilled orders, and has set a schedule of 6000 units for the month.

Cadillac and LaSalle production for March amounted to 4500 units, an increase of 20 per cent over February figures. The total first quarter production exceeded by 37 per cent the figure for the corresponding period of 1927.

Employment in Detroit continues to increase, the total gain for the past week amounting to a little more than 1000, and bringing the total to date to nearly 370,000.

There has been no change in the price of automotive steel, the price structure remaining firm. Blue annealed sheets are quoted at 2.10c. to 2.20c. base, Pittsburgh. Auto body sheets are quoted at 4.15c., Pittsburgh. Likewise, there has been no fluctuation in the alloy steel bar list.

The steady increase in industrial production has kept industrial construction active. The small structural shops are carrying a good volume of work. Structural bars, plates and shapes are quoted at 1.90c., Pittsburgh, for small lots and at 1.85c. on contracts.

There has been no change in the market on old material during the past two weeks. Dealers have sufficient orders to cover current production, which is on the highest basis for the year. No sales involving large tonnage have been made. Melters seem to be buying very close to their actual requirements. Prices are the same as were quoted in the March 29 issue.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Heavy melting and shoveling steel	$11.00 to $11.50
Borings and short turnings	7.25 to 7.75
Long turnings	6.75 to 7.25
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.50 to 21.00
Hydraulic compressed sheets	9.75 to 10.25
Stove plate	11.00 to 12.00
No. 1 busheling	8.50 to 9.00
Sheet clippings	6.00 to 7.00
Flashings	9.25 to 9.75

Canada

Outlook Continues Good for Steel—Railroad Expansion in Prospect

TORONTO, ONT., April 10.—The outlook in the iron and steel industry of Canada for the second quarter is bright. Canadian mills are experiencing one of the best years since the war. Most of the mills are running close to capacity. Robert Dodds, chairman board of directors and president Lake Superior Corporation, and a director of the Algoma Steel Corporation, Sault Ste. Marie, Ont., announced that the Algoma Steel Corporation is now in the best position it has enjoyed in a great many years; that the net earnings of the company are running approximately $500,000 ahead of the corresponding period last year and that all indications point to this figure being increased to around $1,000,000 by the end of June.

The improvement in the steel industry is not confined to the Algoma Steel Corporation. The Dominion Iron & Steel Co., Sydney, N. S., has large orders on hand for rails and various other iron and steel products. The Steel Co. of Canada, Ltd., Hamilton, Ont., is running practically at capacity, and as its products are more diversified than the two companies mentioned, it has been even more favored than the others in securing new business. The programs of the Canadian National Railways and the Canadian Pacific are expected to result in even greater improvement in the steel industry before the end of the year.

Pig Iron.—Following the active buying movement of the past two or three weeks, during which many melters covered for second quarter needs, foundry and malleable pig iron sales declined somewhat during the week. Spot sales are holding at a high level, orders ranging from 100 to 200 tons. The higher melt by foundries is reflected in a stronger demand for foundry and malleable iron, but the low prices prevailing in the United States, together with the strong competition in Canadian markets from that quarter, are holding quotations in this country at a low level.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	$24.50 to $25.00
No. 2 foundry, sil. 1.75 to 2.25	24.50 to 25.00
Malleable	24.50 to 25.00
Basic	24.00
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Rails.—Hon. C. A. Dunning, Minister of Railways and Canals, informed the Railway Committee of the House of Commons that charters for 3233 miles of railway in Canada were being applied for by companies other than the Canadian National and Canadian Pacific. The cost of this mileage he estimated at about $173,000,000. In addition there are applications before the Provincial legislatures which bring the total mileage up to approximately 4400 miles, with an estimated cost of $242,000,000. This does not include equipment, which would make the total proposed expenditure approximately $300,000,000.

Old Material.—While sales on spot account are holding well up to those of former weeks, business as a whole declined somewhat during the past few days.

Old material prices are firm but unchanged in Montreal and Toronto markets.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast	....	16.00
Stove plate	....	12.00
Standard carwheels	....	14.50
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Cincinnati

Pig Iron Sales Exceed 10,000 Tons—Sheet Prices Weaker

CINCINNATI, April 10.—For the first time in several months, pig iron sales during the past week exceeded 10,000 tons. However, three orders made up a large part of the total, so that the buying is not indicative of widespread consumer interest. In fact, the absence of important inquiries is noticeable and gives little encouragement to dealers who have been expecting a pick-up in bookings. Lake Erie furnaces are reported to be making quotations in this district which range from $16.25 to $16.75, base Cleveland, with somewhat irregular observance of silicon differentials. In the South, both Alabama and Tennessee makers are asking $16, base Birmingham, but are getting little business north of the Ohio River. At Ironton, furnace interests claim to be holding to a base price of $19, but concessions of as much as $1 a ton have been made to obtain tempting orders. It can safely be said that Ironton companies are moving little iron, and even if quotations are shaded their market is still seriously circumscribed by competition from northern Ohio furnaces. Jackson County silvery iron is steady at $25, base furnace, for 8 per cent. The largest pig iron sale of the week was 4000 tons of Southern foundry. Hamilton Coke & Iron Co., Hamilton, Ohio, expects to blow in its new furnace the second week in May. This furnace will supply hot metal to the open-hearth furnaces of the American Rolling Mill Co. at its East Side Works in Middletown.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89
So. Ohio malleable	$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	19.69
Alabama fdy., sil. 2.25 to 2.75	20.19
Tennessee fdy., sil. 1.75 to 2.25	19.69
Southern Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—With the opening of the second quarter, there has been somewhat of a let down in the number of orders placed by sheet consumers, and concessions are being made by certain mills to get business. In galvanized stock, for instance, 3.65c., base Pittsburgh, is rapidly becoming the basis for transactions, even though some producers are still nominally adhering to 3.75c. Irregular quotations prevail throughout the South, where competition for the roofing trade is intense. Black sheets are being sold to large customers at 2.80c. and in some cases at 2.75c., but mills still are insisting upon small users paying 2.90c. A leading producer in this district has reduced automobile body sheets to 4c., blue annealed to large buyers to 2c. and black to 2.75c. On the two latter grades $2 a ton higher is asked for the ordinary run of business. The American Rolling Mill Co. reports that its four units are continuing to operate at 100 per cent of capacity. With the coming of mild weather there has been a revival of activities in structural steel, although sizable jobs are scarce. Small fabricators, however, are well pleased with the amount of work which they are obtaining. Sales of bars have been only fair, but specifications against old contracts have been large. Bars, structural shapes and plates are quoted at 1.85c. to 1.90c., base Pittsburgh. Common wire nails are being sold at $2.55 per keg, base Ironton, with a barge rate to this city of 14c., thus making a delivered price in Cincinnati of $2.69. Several Eastern sellers are holding to $2.65 per keg, base Pittsburgh, but cannot get desirable orders at that figure.

Reinforcing Bars.—The Pollak Steel Co. will furnish 500 tons of rail steel bars for the Broadway garage, this city, and a like amount for the new building of the Young Men's Christian Association in Dayton, Ohio. Joseph T. Ryerson & Son Co., Inc., has been awarded 800 tons of new billet bars for the Dayton Biltmore Hotel, Dayton, while bids are being taken on 300 tons of bars for a municipal sewage plant at Dayton. New billet bars are selling at 1.85c. to 1.95c., base Pittsburgh, and rail steel stock at 1.80c. to 1.85c., base mill.

Warehouse Business.—Orders are being received at a moderate rate by local jobbers. Structural steel is in fairly good demand, while bars and tank plates also are active. Prices are unchanged.

Coke.—Specifications for by-product foundry coke from foundries affiliated with the automobile industry have fallen off, and shipments in April are likely to be considerably less than in March. On the other hand, sales of domestic coke have been greatly stimulated by the sharp decline in prices, with the result that dealers are taking advantage of the opportunity. A consumer in this district has taken 2000 tons of Wise County foundry coke for delivery in this quarter. However, the demand for beehive foundry and furnace coke from the Wise County and New River sections has been light.

Foundry coke prices per net ton, delivered Cincinnati: By-products coke, $9.02; Wise County coke, $7.09 to $7.59; New River coke, $9.09 to $9.59. Freight rates, $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Heavy melting steel has advanced 50c. a ton, but other items have not changed. Steel plants in the district are operating at a high rate and are accepting a normal amount of material on current contracts. Blast furnace and foundry grades, on the other hand, are slow. Railroads are offering unusually large lists this month, the Southern having 9000 tons, Louisville & Nashville, 14,000; Chesapeake & Ohio, 9400, and Norfolk & Western, 16,400. Included in the total tonnages are approximately 14,000 tons of rails.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$11.50 to $12.00
Scrap rails for melting	11.75 to 12.25
Loose sheet clippings	8.50 to 9.00
Bundled sheets	9.50 to 10.00
Cast iron borings	8.00 to 8.50
Machine shop turnings	7.50 to 8.00
No. 1 busheling	10.00 to 10.50
No. 2 busheling	7.00 to 7.50
Rails for rolling	12.50 to 13.00
No. 1 locomotive tires	12.75 to 13.25
No. 1 railroad wrought	10.00 to 10.50
Short rails	15.75 to 16.25
Cast iron carwheels	12.25 to 12.75
No. 1 machinery cast	15.50 to 16.00
No. 1 railroad cast	13.00 to 13.50
Burnt cast	7.50 to 8.00
Stove plate	8.25 to 8.75
Brake shoes	9.50 to 10.25
Railroad malleable	12.00 to 12.50
Agricultural malleable	11.50 to 12.00

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforcing bars	3.15c.
Rail steel reinforcing bars	3.00c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb.	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100 lb.	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Apr. 10	Apr. 9	Apr. 5	Apr. 4
Lake copper, New York	14.30	14.30	14.30	14.30
Electrolytic copper, N. Y.*	14.12½	14.12½	14.12½	14.12½
Straits tin, spot, N. Y.	52.00	52.50	52.75	53.12½
Lead, New York	6.10	6.10	6.10	6.10
Lead, St. Louis	6.00	6.00	6.00	6.00
Zinc, New York	6.10	6.10	6.10	6.10
Zinc, St. Louis	5.75	5.75	5.75	5.75

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, April 10.—Market activities have been slowed up both here and abroad by the Easter holidays. There were no markets here or in London on April 6 and 7 and also none in London yesterday, April 9. The markets generally are quiet and prices are firm.

Copper.—Buying, both for foreign and domestic consumption, is very light following the holidays and it has been so during all of the last week. A small amount of electrolytic copper has been obtainable at a slight concession from the ruling quotation of 14.25c., delivered in the Connecticut Valley, but it is likely that nothing can be bought today under the price maintained by leading producers. The quotation of Copper Exporters, Inc., is unchanged at 14.50c., c.i.f. usual European ports. Following the heavy buying in March, a quiet but firm market is anticipated for the immediate future. Lake copper is only moderately active but firm at 14.30c., delivered.

Tin.—With London closed part of the week, the market here has been much quieter and sales have been lighter. The total for the past week was about 700 tons, half of which was taken by consumers. The market generally is featureless. There is, however, one factor hanging over it. It is expected that, because shipments of Banca tin have been so small the past three months, the quantity accumulated will begin to come out this month and the question arises whether the market can take care of it. Prices both here and in London are down from a week ago because of lack of demand and to the Banca situation. In London spot standard today is quoted at £235 7s. 6d., future standard at £235 15s. and spot Straits at £239 7s. 6d. The Singapore price today was £240 5s. Spot Straits tin at New York today was quoted at 52c. in a weak market because of lack of demand. Arrivals thus far this month have been 2735 tons with 5120 tons reported afloat.

Lead.—Buying previous to the holidays was large, but yesterday and today the market has been fairly quiet. The quotation of the leading interest remains unchanged at 6.10c., New York, as its contract price. In the outside market some sales have been made in the East as high as 6.15c. The quotation at St. Louis is firm at 6c. Very little activity is reported from that district.

Zinc.—With consumers of prime Western zinc well covered for nearby needs and with producers not anxious to do business, the market is quiet and the quotation has been firm for the week at 5.75c., St. Louis, or 6.10c., New York. Ore at Joplin was unchanged at the close of last week at $38 per ton, with production still fairly low at about 9500 tons and sales larger than production at close to 11,000 tons. Distress metal, which was pressing on the market in March, is believed to have been practically all absorbed.

Nickel.—Ingot nickel in wholesale lots is quoted unchanged at 35c. with the metal in the form of shot at 36c. and with electrolytic nickel at 37c. a lb.

Antimony.—Chinese metal for all positions is a little higher and is quoted at 9.62½c. to 9.75c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, April 10.—This market is quiet. Prices for tin are down while quotations on lead and zinc have

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	54.50c. to 55.50c.
Tin, bar	57.00c. to 58.00c.
Copper, Lake	15.25c.
Copper, electrolytic	15.00c.
Copper, casting	14.25c.
Zinc, slab	6.75c. to 7.25c.
Lead, American pig	7.00c. to 7.50c.
Lead, bar	9.25c. to 10.25c.
Antimony, Asiatic	12.00c. to 12.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99 per cent pure)	25.00c. to 26.00c.
Aluminum ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	34.00c. to 35.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	59.00c.
Tin, bar	61.00c.
Copper, Lake	14.85c.
Copper, electrolytic	14.85c.
Copper, casting	14.00c.
Zinc, slab	7.50c.
Lead, American pig	6.95c.
Antimony, Asiatic	16.00c.
Lead, bar	9.25c.
Babbitt metal, medium grade	19.75c.
Babbitt metal, high grade	63.00c.
Solder, ½ and ½	34.00c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.50c. to 19.25c.
Copper, hot rolled	23.00c. to 24.00c.
Copper, cold rolled, 14 oz. and heavier	25.50c. to 26.50c.
Seamless Tubes—	
Brass	23.37½c. to 24.37½c.
Copper	24.50c. to 25.50c.
Brazed Brass Tubes	26.50c. to 27.50c.
Brass Rods	16.25c. to 17.25c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	9.00c. to 9.50c.
Zinc sheets, open	10.00c. to 10.50c.

Non-Ferrous Rolled Products

Mill prices on copper sheets, copper wire and copper in rolls have been advanced ¼c. and are now quoted at 23c., 16c. and 22c., respectively. Bronze and brass products, lead full sheets and zinc sheets have not changed.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.75c.
Copper, hot rolled	23.00c.
Zinc	8.50c.
Lead (full sheets)	9.75c. to 10.00c.
Seamless Tubes—	
High brass	23.62½c.
Copper	24.50c.
Rods—	
High brass	16.50c.
Naval brass	19.25c.
Wire—	
Copper	16.00c.
High brass	19.25c.
Copper in Rolls	22.00c.
Brazed Brass Tubing	26.75c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	18.75c.
Copper, hot rolled	22.75c.
Copper, cold rolled, 14 oz and heavier	25.00c.
Zinc	10.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.12½c.
Copper	26.00c.
Brazed Brass Tubes	26.75c.
Brass Rods	16.50c.

advanced. Prices for old metals are unchanged in a dull market.

Prices, per lb., in carload lots: Lake copper, 14.25c.; tin, 54c.; lead, 6.15c.; zinc, 5.85c.; in less-than-carload lots, antimony, 11.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9.50c.; red brass, 9.25c.; yellow brass, 7c.; lead pipe, 4.75c.; zinc, 3.25c.; pewter, No. 1, 30c.; tin foil, 36c.; block tin, 45c.; aluminum, 11.75c.; all being dealers' prices for less-than-carload lots.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.00c.	13.50c.
Copper, heavy and wire	11.75c.	12.875c.
Copper, light and bottoms	10.00c.	11.25c.
Brass, heavy	7.00c.	8.50c.
Brass, light	6.00c.	7.50c.
Heavy machine composition	9.50c.	10.625c.
No. 1 yellow brass turnings	7.75c.	9.00c.
No. 1 red brass or composition turnings	8.75c.	9.75c.
Lead, heavy	5.00c.	5.50c.
Lead, tea	4.00c.	4.50c.
Zinc	3.00c.	3.50c.
Sheet aluminum	12.50c.	14.50c.
Cast aluminum	12.50c.	14.00c.

FABRICATED STRUCTURAL STEEL

New York Office Building Will Require 17,000 Tons—Awards Decline to 32,000 Tons

AN office building in New York which will take 17,000 tons brought the total of new projects reported during the week to 37,200 tons. Lettings amounted to 32,000 tons, the largest being 8000 tons for a bridge across the Delaware River at Tacony, Pa., 6000 in bridges for the Chicago & North Western Railroad and 7000 tons for miscellaneous projects in New York. Awards follow:

BOSTON, 100 tons, post office garage to New England Structural Co.

LAWRENCE, MASS., 150 tons, highway bridge, to New England Structural Co.

NEW YORK, 13,500 tons reported to the Structural Steel Board of Trade; 7000 tons in the following awards not previously reported: National City Bank at Jamaica, L. I., factory building for Consolidated Safety Pin Co. at Bloomfield, N. J., and building for Starlight Amusement Park on 177th Street, to McClintic-Marshall Co.; office building at 666 Fifth Avenue, column cores for building at Canal and Hudson Streets, column cores for building at Varick and Dominick Streets and alteration for Borden Building at Hollis, L. I., to Levering & Garrigues Co.; tenement building at 148 East Fiftieth Street, to Hay Foundry & Iron Works; office building at Church and Worth Streets, to Harris Structural Steel Co., and loft building at Fifth Avenue and Twenty-ninth Street, to Post & McCord, Inc.

NEW YORK, 1065 tons, apartment building at Park Avenue and Eighty-third Street, to Easton Structural Steel Co.

NEW YORK, 200 tons, pier No. 34, North River, to McClintic-Marshall Co.

NEW YORK CENTRAL RAILROAD, 125 tons, bridge, to American Bridge Co.

ORANGE COUNTY, N. Y., 200 tons, State highway bridge, to American Bridge Co.

PENNSYLVANIA RAILROAD, 125 tons, bridge in Indiana, to American Bridge Co.

LOCK HAVEN, PA., 250 tons, high school, to Shippers Car Line Corporation.

WILLIAMSPORT, PA., 300 tons, Y. W. C. A., to McClintic-Marshall Co.

PHILADELPHIA 8000 tons, Tacony-Palmyra bridge, to American Bridge Co.

CAMDEN, N. J., 250 tons, plant for Campbell Soup Co., to McClintic-Marshall Co.

MCKEES ROCKS, PA., 100 tons, church, to Pittsburgh-Des Moines Steel Co.

NEW CASTLE, PA., 400 tons, Shenango Motor Co. building, to Guibert Steel Co.

WILKENSBURG, PA., 500 tons, office building, to American Bridge Co.

OXFORD, OHIO, 100 tons, grandstand, to Pittsburgh-Des Moines Steel Co.

CANTON, OHIO, 200 tons, stripper building for Timken Roller Bearing Co., to McClintic-Marshall Co.

WILMINGTON, N. C., 2100 tons, bridge, to Vincennes Bridge Co.

DETROIT, 250 tons, building for Finsterwald Furniture Co., to Massillon Bridge & Structural Co.

STATE OF MICHIGAN, 300 tons, three highway bridges, to Massillon Bridge & Structural Co.

CHICAGO, 260 tons, building for W. F. McLaughlin Co., to American Bridge Co.

CHICAGO & NORTH WESTERN RAILROAD, 6000 tons, bridges; 5400 tons, to American Bridge Co., and 600 tons, to Clinton Bridge Works, Clinton, Iowa.

CHICAGO, 1100 tons, building for Chicago Motor Club, to American Bridge Co.

CHICAGO, 4000 tons, building for Palmolive Peet Co., to American Bridge Co.; previously reported to unnamed bidder.

SAUKVILLE, WIS., 200 tons, State highway span over Milwaukee River, to Worden-Allen Co.

OGDEN, UTAH, 600 tons, train sheds, to Omaha Steel Works.

RENO, NEV., 200 tons, office building, to California Steel Co.

PORTLAND, ORE., 800 tons plates, three lightships for Government, to Albina Marine Engine Works.

GLENDALE, CAL., 650 tons, school buildings, to Llewellyn Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

FITCHBURG, MASS., 175 tons, theater.

LEOMINSTER, MASS., 150 tons, theater.

BOSTON, 200 tons, New York, New Haven & Hartford Railroad freight station.

BOSTON, 175 tons, theater on Hanover Street.

STATE OF NEW HAMPSHIRE, 500 tons, highway bridges.

NEW YORK, 17,000 tons, Reynolds office building at Lexington Avenue and Forty-second Street.

NEWARK, N. J., 1800 tons, bridge for Lehigh Valley Railroad.

NEW BRUNSWICK, N. J., 400 tons, arch centers for reinforced concrete bridge; bids in on general contract.

ALLENTOWN, PA., 280 tons, arch centers for reinforced concrete bridge; general contract to Seeds & Durham, Germantown, Pa.

WILMINGTON, DEL., 800 tons, highway bridge.

BALTIMORE, 400 tons, St. Mary's Seminary.

CHARLESTON, W. VA., 1700 tons, office building and bank.

WILMINGTON, N. C., 500 tons, electric station for Phoenix Utility Co.

BUFFALO, 750 tons, Buffalo Forum, ice skating rink; bids April 20.

CINCINNATI, 300 tons, St. Gregory's Seminary.

CLEVELAND, 1000 tons, Lake Shore Hotel.

PORTAGE, WIS., 350 tons, Wisconsin Street lift span over Government canal; bids about May 15, J. T. Henton, County highway commissioner.

CHICAGO, 250 tons, addition to Revell Building.

CHICAGO, 110 tons, power house for Chicago, Burlington & Quincy Railroad; American Bridge Co., low bidder.

CHICAGO, 3000 tons, 24-story apartment building.

CHICAGO, 1000 tons, office building at LaSalle and Lake Streets.

STATE OF ILLINOIS, 900 tons, highway bridges at Florence, Ingleside and Willow Springs.

NEW ORLEANS, 3100 tons, wharf sheds at Girod and Poydras Streets.

SAN DIEGO, CAL., 400 tons, seaplane hangar.

CRESCENT CITY, CAL., 600 tons, cantilever bridge.

HERMON, CAL., 900 tons, bridge.

OAKLAND, CAL., 350 tons, hangars for City Port Commission; Moore Drydock Co., low bidder.

LOS ANGELES, 150 tons for city work; McClintic-Marshall Co., low bidder.

Rolling mill machinery of the cluster type will be supplied by the E. W. Bliss Co., Brooklyn, to the Hirsch-Kupfer & Messingwerks, of Germany, in whose interest Messrs. Hirsch, Mata, Loewenstein and Seeger have been touring the United States, inspecting latest improvements in rolling mill equipment.

REINFORCING STEEL

New Projects Will Take 9300 Tons, With 5000 Tons in Illinois Sewer Job

WITH 5000 tons for a sewer project at Stickney, Ill., and 2000 tons for road work in the same State, about 9300 tons of reinforcing steel was added to pending work in the last week. Lettings amounted to 4300 tons, the largest of which was 1100 tons for road work in Illinois. Awards follow:

CINCINNATI, 500 tons, Broadway Garage, to Pollak Steel Co.

DAYTON, OHIO, 500 tons, Young Men's Christian Association building, to Pollak Steel Co.

STATE OF ILLINOIS, 1100 tons of rail steel bars for road work; 600 tons to Calumet Steel Co., 400 tons to Republic Iron & Steel Co., and 100 tons to Truscon Steel Co.

CHICAGO, 140 tons of rail steel bars, apartment building at 440 Barry Avenue, to Calumet Steel Co.

CHICAGO, 100 tons of rail steel bars, grain elevator, to Inland Steel Co.

CHICAGO, 200 tons of rail steel bars, office building at 30 West Washington Street, to Inland Steel Co.

CHICAGO, 100 tons of rail steel bars, apartment building at Deming and Geneva Streets, to Inland Steel Co.

CHICAGO, 190 tons, garage at Greenview and Greenwood Avenues, to unnamed bidder.

NATIONAL CITY, ILL., 115 tons, additions to building at National Stock Yards, to Laclede Steel Co.

ST. LOUIS, 250 tons, Mark Twain Hotel, to Laclede Steel Co.

LOS ANGELES, 663 tons, for city of Los Angeles, to Blue Diamond Co.

RIVERSIDE, CAL., 120 tons, Victoria Avenue bridge, to unnamed bidder.

SAN FRANCISCO, 110 tons, Produce Building, to W. S. Wetenhall Co.

SEATTLE, WASH., 200 tons, Stimson Building, to unnamed interest.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

DAYTON, OHIO, 300 tons, municipal sewage plant.

STICKNEY, ILL., 5000 tons, sewer project.

SPRINGFIELD, ILL., 2000 tons, State road work.

AURORA, ILL., 350 tons, reservoir.

EVANSTON, ILL., tonnage not stated, apartment building; Hall, Radcliff & Lawrence, architects.

EVANSTON, tonnage being estimated, Young Men's Christian Association building.

LOS ANGELES, 5257 tons, Drainage Improvement District No. 23; Will F. Peck, low bidder on general contract.

SAN FRANCISCO, 212 tons, Kezar stadium; bids opened.

SEATTLE, WASH., 1000 tons, warehouse for Peck & Hills Furniture Co.; bids being taken.

SEATTLE, 420 tons, warehouse for William Volker; bids being taken.

Steel Corporation's Unfilled Orders Declined in March

Unfilled orders on the books of the United States Steel Corporation declined moderately in March. The total on March 31 was 4,335,206 tons, a decrease of 62,983 tons from the 4,398,189 tons on Feb. 29. In February there was a gain of 122,242 tons, the fifth month in succession. A year ago in March the unfilled orders were 3,553,140 tons. The following table gives the unfilled tonnage by months, commencing with January, 1926:

	1928	1927	1926
Jan. 31	4,275,947	3,800,177	4,882,739
Feb. 28	4,398,189	3,597,119	4,616,822
Mar. 31	4,335,206	3,553,140	4,379,935
April 30	.....	3,456,132	3,867,976
May 31	.....	3,050,941	3,649,250
June 30	.....	3,053,246	3,478,642
July 31	.....	3,142,014	3,602,522
Aug. 31	.....	3,196,037	3,542,335
Sept. 30	.....	3,148,113	3,593,509
Oct. 31	.....	3,341,040	3,683,661
Nov. 30	.....	3,454,444	3,807,447
Dec. 31	.....	3,972,874	3,960,969

The high record in unfilled orders was 12,183,093 tons at the close of April, 1917. The lowest was 2,674,757 tons on Dec. 31, 1910.

The Carnegie Steel Co. will add a 16-stand 10-in. electrically driven merchant mill to its McDonald, Ohio, group for rolling cotton ties and narrow strips. An identical mill is to be built by the Tennessee Coal, Iron & Railroad Co. at Fairfield, Ala.

RAILROAD EQUIPMENT

St. Paul Road Buys 4450 Freight Cars—Texas & Pacific Inquires for 20 Locomotives

PLACING of 4450 freight cars by the Chicago, Milwaukee, St. Paul & Pacific and of 600 steel underframes for refrigerator cars by the Pacific Fruit Express were the outstanding transactions of the railroad equipment market in the last week. The Texas & Pacific has inquired for 20 locomotives. Details of the week's business follow:

Chicago, Milwaukee, St. Paul & Pacific has placed orders for 4450 freight cars distributed as follows: 500 box cars with Pressed Steel Car Co.; 1250 box cars with Bettendorf Co.; 500 box cars with General American Car Co.; 250 box cars with Pacific Car & Foundry Co.; 500 hopper cars with Standard Steel Car Co.; 500 hopper cars with Pullman Car & Mfg. Corporation; 650 stock cars with Ryan Car Co., and 300 automobile cars with American Car & Foundry Co. With the 200 ore cars reported purchased last week, this road's original inquiry has been entirely acted upon.

Pacific Fruit Express has ordered 600 steel underframes for refrigerator cars from American Car & Foundry Co. to be used for building cars in its own shops.

Egyptian State Railways are inquiring for 320 low-side gondola cars of 10 tons' capacity.

Detroit, Toledo & Ironton will purchase two baggage mail and two passenger coaches.

Pennsylvania Railroad is considering reviving its inquiry for 300 passenger train refrigerator cars.

Atchison, Topeka & Santa Fe has ordered 15 locomotive tenders from Baldwin Locomotive Works.

Texas & Pacific has made inquiry for 15 2-10-4-type and five Mountain-type locomotives.

Dominion Coal Co. has ordered one Mogul-type and one Mikado-type locomotives from American Locomotive Co.

Akron, Canton & Youngstown has ordered two Mikado-type locomotives from Lima Locomotive Works, Inc.

San Francisco Iron and Steel Market

(*Concluded from page* 1047)

mosa Beach, Cal. Bids were opened on 127 tons of 6-in. class B for the improvement of Washington Street, Riverside, Cal. Los Angeles has opened bids on 234 tons of 24-in. class B pipe and Monrovia, Cal., will open bids on April 16 for 2764 tons of 4 to 16-in. class B and 20-in. class A pipe.

Standard Pipe.—H. G. Cult, Brighouse, B. C., took 510 tons of 4 and 6-in. seamless pipe for Brighouse, B. C. The Pacific Gas & Electric Co., San Francisco, placed 2600 tons of 8 to 36-in. standard pipe with an Eastern producer. Monrovia, Cal., will take bids on April 16 for 710 tons of 4 to 20-in. lapweld pipe dipped and wrapped. Bids have been opened on 125 tons of 2 to 8-in. pipe for Armona, Cal.

Rails.—The Seattle Municipal Railway is taking bids on 200 tons of 80 lb. rail. No other inquiries of importance are before the trade for figures at the moment.

Coke.—Demand for coke is spotty and few inquiries or sales of size are noted. Another shipment of English beehive and by-product coke is en route to the Coast and will arrive about May 6. This vessel has 4500 tons aboard and the bulk of the shipment will be distributed between Los Angeles and San Francisco foundries.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.95c.
Blue annealed sheets (No. 10)	3.90c.
Galvanized sheets (No. 24)	5.50c.
Structural rivets, ½-in. and larger	5.65c.
Common wire nails, base per keg	$3.40
Cement coated nails, 100-lb. keg	3.40

PERSONAL

Charles M. Easterly, whose resignation as vice-president of the Inland Steel Co. of Wisconsin, Milwaukee, and district manager of the Inland company at that city, was mentioned in THE IRON AGE last week, will now devote his entire time to the Capital City Culvert Co., Madison, Wis., of which he is president and majority stockholder. He will remove his headquarters to Madison. Mr. Easterly was district sales manager for the Inland Steel Co. for 18 years and previously represented the Berger Mfg. Co., Canton, Ohio, and the Stark Rolling Mill Co., also of Canton, now divisions of the Central Alloy Steel Corporation.

C. M. EASTERLY

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O. W. Irwin has been appointed manager of the steel joist department of the Truscon Steel Co., Youngstown, succeeding John Bowditch, Jr., who has resigned to locate in Pittsburgh. Mr. Irwin has been in the sales department of the Truscon company for many years.

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Ralph N. Sourbeck, recently sales engineer with the Clarkson Coal & Dock Co., Cleveland, has become associated with the Cleveland Duplex Machinery Co., Inc., Cleveland, and will be in charge of its surplus machinery department. In his new capacity he will purchase and liquidate industrial plants and supervise the rebuilding of machine tools.

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Robert Weatherly, assistant sales manager of the Federal Abrasives Co., Birmingham, has been appointed sales manager of that company and other subsidiaries of the Federal Electrochemical Co., namely the Federal Phosphorus Co., the Federal Carbide Co. and the Southern Manganese Corporation. His headquarters will be at the Birmingham offices of these companies. S. D. Crenshaw, Jr., and H. P. Walmsley have been appointed assistant sales managers of the Federal Abrasives Co., and will maintain headquarters at Birmingham and Philadelphia, respectively.

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Charles E. Ahl, formerly with the Vesuvius Crucible Co., now is associated with J. B. Booth & Co., Pittsburgh. This company represents Hiram Swank's Sons, Johnstown, Pa., refractories manufacturers, in the Pittsburgh district, and Mr. Ahl will devote his time to the sale of its products.

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William C. Smith, manager of the Fulton, N. Y., plant of the McHenry-Millhouse Mfg. Co., has been elected a vice-president of the company and will continue in charge of the plant.

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Henry Sears Hoyt, of A. Milne & Co., 745 Washington Street, New York, steel and iron merchants, sailed for Havana, Cuba, on April 6 and will visit his firm's distributers in that country.

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F. P. Walsh has been appointed manager of the crane department, and R. H. Moore, manager of the foundry equipment department of the Whiting Corporation, Harvey, Ill.

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Edwin B. Peet, who was associated with the E. W. Bliss Co., Brooklyn, several years ago, has returned to that company and will devote himself principally to the sale of can making machinery and allied products.

Virgil Jordan, chief economist of the National Industrial Conference Board, New York, will be the principal speaker at the monthly luncheon and business meeting of the Credit Association of the Building Trades of New York at the Hotel McAlpin in that city on Tuesday, April 24.

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W. H. Graham is in charge of a district sales office which has been opened at 1 East Forty-second Street, New York, by the Graham Bolt & Nut Co., Pittsburgh. His territory will include metropolitan New York and New England.

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M. L. Northrup, New England manager of the Warren Foundry & Pipe Co., Phillipsburg, N. J., is back at his office in Boston, after an extended rest in Florida following an operation.

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A. H. McDougall, vice-president Whiting Corporation, Harvey, Ill., will speak at a meeting of the St. Louis District Foundrymen's Club at the Missouri Athletic Association on April 17, his subject being "Cupola Practice." H. R. Cutting, Carondelet Foundry Co., St. Louis, will lead a discussion of the work done recently at Pittsburgh toward the establishment of a research group on gray iron foundries.

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Tom D. Taylor, metallurgist Bliss & Laughlin Steel Corporation, Harvey, Ill., addressed the monthly meeting of the Indianapolis chapter of American Society for Steel Treating, April 9, on the subject of "Cold Drawn Steels."

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Joseph H. Jeffcott has recently become associated with the Vulcan Mold & Iron Co., Latrobe, Pa., in the sales and service department, taking the place of Thomas Windsor Evans, resigned. Mr. Jeffcott has been connected with the iron and steel industry for the past 20 years in both operating and sales capacities. His early experience was in the ingot mold foundry of the Bethlehem Steel Co., where he later was in charge of the Lower Works open-hearth department. He has also been connected with the Donner Steel Co., Buffalo, as open-hearth superintendent and more recently with the Jones & Laughlin Steel Corporation, Pittsburgh, at its Scho plant.

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D. E. McLaughlin, formerly vice-president, was elected president of the Pacific Coast Steel Co., San Francisco, at the annual meeting of stockholders. He succeeds the late Judge E. M. Wilson. William Pigott was named chairman of the board of directors, E. S. Houdlette and T. S. Clignan were elected vice-presidents and William Pigott, Jr., was reelected secretary-treasurer.

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C. B. S. Jackson, for the last six years superintendent of the Norton Iron Works, Ashland, Ky., has been appointed superintendent of the Texas Nail & Wire Mfg. Co., Galveston, Tex.

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Harry Woodhead has been appointed general manager of the Cleveland plant of the Truscon Steel Co., Youngstown, Ohio. This was formerly the East Side plant of the Hydraulic Pressed Steel Co. and will be known as the Hydraulic Pressed Steel Division of the Truscon Steel Co. Mr. Woodhead had been with the Hydraulic company for several months and was previously connected with the Midland Steel Products Co., Cleveland, and the A. O. Smith Corporation, Milwaukee.

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H. K. Ferguson, president H. K. Ferguson Co., Cleveland, has been elected president of the University Club of that city.

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Dudley V. Walker, sales agent Vulcan Iron Works, New Britain, Conn., has been made general manager of the Malleable Iron Works, New Britain, succeeding Frank Miller.

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Marcus Chase has resigned as manager of the Boston office of the Niles-Bement-Pond Co. He has been associated with the company for approximately 30 years.

M. S. Bradley, who has been with the company for 15 years, is acting manager. W. S. McCormick has resigned as manager of the Pittsburgh office of the Niles company, and P. C. McBeth is acting manager.

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F. F. Harter has been appointed district sales manager for New York and eastern Pennsylvania of the Cyclops Steel Co., Titusville, Pa., and the Universal Steel Co., Bridgeville, Pa. His headquarters for the present will be at the office of the Cyclops company at Titusville.

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O. W. Young, formerly in the western division sales office of the Hyatt Roller Bearing Co., Chicago, has been appointed chief engineer and will be located at the company's headquarters in Newark, N. J. He joined the Hyatt company in 1915 as sales engineer, serving in that capacity for several years. He then took charge of all engineering activities of the western division, and during the last two years was assistant manager in charge of sales to the tractor and agricultural equipment industry.

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Philip Stremmel, who has been acting superintendent of the Granite City Steel Co., Granite City, Ill., has been made general superintendent.

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George L. Meyer, Jr., for a number of years purchasing agent of the Stewart-Warner Speedometer Corporation, Chicago, has been put in charge of production and will retain supervision over purchases of the company.

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Charles R. McGrail has been appointed metallurgist and chemist at the Sheffield Works of Fairbanks, Morse & Co., Three Rivers, Mich.

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E. C. Smith, assistant general superintendent of the Central Alloy Steel Corporation, Massillon, Ohio, spoke before the Hartford, Conn., chapter of the American Society for Steel Treating on April 10, on the manufacture and application of high grade automotive alloy steels.

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William S. McCormick, who resigned recently as Pittsburgh sales manager for the Niles Tools Works Co., Hamilton, Ohio, and the Pratt & Whitney Co., Hartford, Conn., is now Western sales representative for Leeds, Tozzer & Co., Inc., 75 West Street, New York.

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H. W. Kent has resigned as president of the Todd Drydocks, Inc., Seattle, and will devote his time to private interests. He will continue as a director of the Todd company.

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George T. Aitken has been appointed manager of industrial sales for the Peden Iron & Steel Co., Houston, Tex. He was formerly associated with Fairbanks, Morse & Co. at Indianapolis and previously had been sales manager of the Vonnegut Machinery Co., Indianapolis.

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R. L. Rickwood, supervisor of design for the Cincinnati Bickford Tool Co., Cincinnati, has resigned to become mechanical superintendent of the Cincinnati Enquirer Building. He will be succeeded by Thomas Addison, formerly of the Cincinnati Planer Co.

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H. C. White has been appointed works manager for the Western Harvester Co., Stockton, Cal. He had had charge of the plant when it was operated by the Holt Mfg. Co.

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W. R. Bean, president Grindle Fuel Equipment Co., Harvey, Ill., will speak at the monthly meeting of the Pittsburgh Foundrymen's Association at the Fort Pitt Hotel, Pittsburgh, Monday evening, April 16. "Metallurgical Problems in the Malleable Iron Foundry" will be his subject.

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J. W. Innes, recently superintendent of the Kelvinator Co. of Canada, Ltd., has been added to the Toronto sales staff of the Arthur Jackson Machine Tool Co., Toronto, and will cover the Hamilton and Niagara peninsula district in Ontario.

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C. A. Wieselthier, purchasing agent for the St. Louis Gas & Coke Corporation, Granite City, Ill., has had his duties expanded to include the purchase of raw materials. Since 1921 raw materials purchases have been made in Chicago under the direction of F. R. Johnson.

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President James A. Farrell of the United States Steel Corporation will make the closing address at the fifteenth National Foreign Trade Convention which will be held at Houston, Texas, on April 25, 26 and 27. His subject will be "Foreign Trade Progress." Another feature of the convention program will be an address by E. P. Thomas, president United States Steel Products Co., on "The Foreign Trade Outlook."

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Robert Leroy Fatzinger, Carnegie Steel Co., Duquesne, Pa.; Charles B. Francis, Carnegie Steel Co., Pittsburgh; Frank Edward Goeckler, Midvale Co., Philadelphia, and George Thomas Motok, Carnegie Institute of Technology, Pittsburgh, will become members of the Iron and Steel Institute at the annual meeting in London, May 3.

OBITUARY

JOHN SOMMER, vice-president and a director and one of the founders of the Keystone Steel & Wire Co., Peoria, Ill., and president of the Mid-States Steel & Wire Co., Crawfordsville, Ind., died on April 7, aged 62 years. He was born at Morton, Ill., and spent his boyhood at that place and at Tremont, Ill. In 1889 he became associated with his father and brother in the manufacture of wire fence at Tremont. The business was removed to Peoria in 1895. In 1901 Mr. Sommer took up his residence at Tremonton, Utah, on account of ill health, where he remained until 1915. Since returning to Peoria he has been prominent in the management of the Keystone company and last year was active in the formation of the Mid-State Steel & Wire Co., organized by a merger of the Crawfordsville Wire & Nail Co., the Dwiggens Fence Co. and the Adrian Wire Fence Co. Two brothers, B. L. and W. H. Sommer are president, and vice-president and general superintendent, respectively, of the Keystone company.

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LEROY PARDEE NEEDHAM, district manager at Chicago for Wheelock, Lovejoy & Co., Inc., Cambridge, Mass., died on March 24 at the Wesley Hospital, Chicago, following an operation. He was born at Coatesville, Pa., in 1890 and was graduated in civil engineering from Pennsylvania State College in 1915. He became associated with Wheelock, Lovejoy & Co., at Cleveland in 1916 and was identified with the sales department of that branch until 1920 when he was made Chicago district manager. During the war he served as an inspector of steels in the Ordnance Department. He was a member of the American Society for Steel Treating.

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ROBERT W. FREELAND, works manager Hubbard Steel Foundry Co., East Chicago, Ind., died at Hammond, Ind., on April 5, of pneumonia. He was graduated from the Carnegie Institute of Technology in 1913 and immediately became associated with the American Steel Foundries, Chicago, as a special apprentice. In 1918 he became manager of the steel foundry of the Edgewater Steel Co., Verona, Pa., and in 1920 served as cost accountant of the Steel Founders' Society of America. He had been with the Hubbard company since 1921.

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GEORGE E. TITCOMB, vice-president McMyler Interstate Co., Bedford, Ohio, and for years prominently

identified with the material handling equipment industry, died April 1. He was connected for a number of years with the Link-Belt Co., Chicago, and became chief engineer of that company. Later he became affiliated with the McMyler Interstate Co. as its Eastern sales manager in New York and in 1925 became its vice-president. He contributed to the successful development of bridge and gantry cranes, car dumpers and coal and ore handling equipment. He was a member of the American Society of Mechanical Engineers.

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MATT BRODIE, for the last 10 years manager of the Asiatic business of the Sullivan Machinery Co., Chicago, with headquarters at Tokio, Japan, died on March 25. He was graduated from the Massachusetts Institute of Technology in 1902 and became associated with the Sullivan company as manager of its Salt Lake City, Utah, office. He was then assigned to foreign duty and for eight years was located in Australia where he organized and conducted the company's Sydney office. In 1916 he was placed in charge of the company's interests in Russia, having left that country after the revolution to take over the company's Asiatic sales.

Wrought Iron Research Association Formed

PITTSBURGH, April 10.—The Wrought Iron Research Association came into existence at a meeting of representatives of the leading manufacturers of wrought iron from various parts of the country at the Duquesne Club here last week. The principal aim of the organization is to gather and disseminate information about wrought iron. The members of the association are the American-Swedo Iron Co., Philadelphia; the Burden Iron Co., Troy, N. Y.; A. M. Byers Co., Pittsburgh; the Cohoes Rolling Mill Co., Cohoes, N. Y.; the Ewald Iron Co., Louisville, Ky.; the Glasgow Iron Co., Philadelphia; the Highland Iron & Steel Co., Chicago; Hughes & Patterson, Philadelphia; the Logan Iron & Steel Co., Philadelphia; the Lockhart Iron & Steel Co., Pittsburgh; the Penn Iron & Steel Co., Creighton, Pa.; the Pittsburgh Forge & Iron Co., Pittsburgh; the Reading Iron Co., Reading, Pa., and the Ulster Iron Works, Dover, N. J.

The executive committee consists of George O. Boomer, vice-president Ewald Iron Co.; Frank W. Hamilton, president Ulster Iron Works; J. M. Gillespie, vice-president Lockhart Iron & Steel Co.; L. M. Johnston, vice-president A. M. Byers Co.; Snowden Samuel, secretary American-Swedo Iron Co.; L. E. Thomas, president Reading Iron Co., and William C. Wolfe, manager of sales Highland Iron & Steel Co. L. M. Johnston was elected president, and Snowden Samuel, secretary-treasurer of the association. Headquarters will be in Pittsburgh.

Study of Distribution Costs Suggested for Simonds Essays

"How Can the Costs of Distribution Be Reduced?" was chosen by 64 out of 138 economists and business men as the best subject for the Simonds prize essay competition for 1928. "To stimulate economic thinking and to increase general economic intelligence," Alvan T. Simonds, president Simonds Saw & Steel Co., Fitchburg, Mass., is offering prizes of $1,000 and $500 respectively for the best two essays on an economic subject.

To select a subject for the essays Mr. Simonds submitted a list of six tentative topics to 210 leading economists and business men, asking them to indicate their preference or to suggest some other subject. Of 138 replies received thus far, nearly one-half chose the subject of distribution costs. The next highest number of votes, 26, was cast for the topic, "Is Advertising Costing the Consumer Too Much?" Seventeen indicated a preference for "Can the Purchasing Power of the Dollar Be Stabilized?" Sixteen votes were divided among the three remaining topics, and 15 replies suggested other subjects.

Standard Trade Customs in Steel Foundry Industry

As a guide in governing the operations of its membership, the Steel Founders' Society of America, 511 Magee Building, Pittsburgh, has issued a list of standard trade customs. These are 20 in number and cover both internal and external matters. They form a notable collection of trade data, the definite acceptance and use of which should be of great value to the industry. The list follows:

1.—When purchasers ask for quotations they should give the actual or estimated rough weights of the castings upon which quotations are to be based.

2.—Unless otherwise arranged, quotations should be accepted and pattern equipment furnished to the foundry by the purchaser within 30 days from the date of such quotations.

3.—Unless otherwise specified, castings are sold as unmachined castings, f.o.b. the foundry. Terms of sale are net cash 30 days from date of invoice. No cash discounts are allowed.

4.—Pattern equipment should be in proper condition and of a type suitable for the economical production of castings of the quality, quantity and delivery required.

5.—Before patterns are made, the purchaser should submit blue prints to the foundry that is to make the castings, to obtain suggestions concerning the best method for constructing the pattern equipment.

6.—When the purchaser furnishes skeleton patterns, coreboxes, sweeps or conjunction patterns which increase the cost of production of castings, an extra charge will be made.

7.—Patterns should be painted in accordance with the following standard practice:

Surfaces to be left unfinished are to be painted black.
Surfaces to be machined are to be painted red.
Seats of and for loose pieces are to be red stripes on a yellow background.
Core prints and seats for loose core prints are to be painted yellow.
Stop-offs are to be indicated by diagonal black stripes on a yellow base.

8.—Patterns, coreboxes and loose pieces thereof shall be properly marked for identification.

9.—Alterations and repairs on pattern equipment shall be paid for by the customer.

10.—The foundry shall not be responsible for loss of, or damage to pattern equipment when caused by fire or other causes beyond its control.

11.—The foundry shall not be expected to provide storage for patterns for which no orders have been received during a period of two years.

12.—All transportation charges on pattern equipment to and from the foundry shall be paid by the customer.

13.—Unless requested in writing, changes in orders will not be accepted by the foundry.

14.—To be effective, cancellation of orders must be mutually agreed to by the foundry and the customer.

15.—After the original order is in production the customer shall reimburse the foundry for castings made or for molds or cores discarded by the foundry due to cancellation, changes in orders or alterations in pattern equipment.

16.—The foundry shall not be liable for damages due to failure to make delivery of castings when such delay is caused by fire, strikes, accidents or other and additional causes beyond the foundry's control.

17.—Claims for errors in weight or in number of castings received shall be made by the customer within 10 days after the receipt of the castings.

18.—The foundry shall not be responsible for machine work or other expense incurred on castings which are later rejected as defective.

19.—The foundry has the right to replace castings rejected by the customer as defective.

20.—The foundry shall not be liable for any special, indirect or consequential damages whatsoever, in connection with any castings it furnishes.

To Add Normalizing Furnaces

The Newton Steel Co., Newton Falls, Ohio, has ordered from the Rust Engineering Co., Pittsburgh, two additional Kathner-type roller bottom sheet normalizing furnaces, 155 ft. long. These will be the same in practically all regards as the two furnaces recently completed, with the exception that one will be 84 in. wide instead of 72 in., which is the width of the other three. The Kathner-type shafts and disks will be supplied by the Duraloy Co. In the Kathner design of shaft, the entire alloy hub and disk is protected from cooling effect, since the water-cooled shaft upon which it is mounted is completely insulated.

Machinery Markets and News of the Works

MACHINERY BUYING FAIR

April Starts Out Less Actively Than March But Outlook Is Good

Almost Total Absence of Railroad Buying—Automobile Parts Manufacturer Seeks About 30 Used Tools

SALES records for March among machine tool builders were quite generally larger than those of either of the two preceding months this year, so that it would not be surprising if April sales were slightly below last month's. However, some manufacturers expect that the total for the month, based on the present outlook, will not be far from 85 to 90 per cent of the March totals. In the first week of April a few manufacturers bettered their March record for the same number of days.

Automobile manufacturers have to a considerable extent satisfied their needs of new equipment for the high production rate at which they are now engaged, but an outstanding inquiry from this field is for 30 or more used tools wanted by a Michigan maker of automobile parts. The Dana Mfg. Co., Toledo, Ohio, continues to buy for the manufacture of shock absorbers for Ford automobiles.

Railroad buying is conspicuously small; in fact, there is an almost total absence of important business in this field. The list of the Union Pacific, on which the Chicago trade has submitted quotations, totals in value about $200,000. The Rock Island is expected to come into the market shortly. Meanwhile, no action has been taken on the pending inquiries of the Santa Fe.

New York

NEW YORK, April 10.

THE first week of April has brought no falling off in orders for machine tools as compared with the average weekly sales in March. Considerable business is pending and, with the general improvement that has come in several lines of manufacture in the past month, the outlook is promising that orders will result this month. Railroad demand, particularly for heavy tools, remains conspicuously dull, but the general inquiry for light and medium-size tools leaves little to be desired. Prices of shapers have been advanced about 10 per cent.

Among the week's sales were the following: A hob and cutter grinder to a manufacturer in Wisconsin; Pratt & Whitney No. 2 jig borer to a Cleveland company; also a No. 2 jig borer to a Michigan company and another to a tool and die company in Detroit; 13-ft. deep-hole drilling machine to a Detroit automobile company; No. 0 Sigourney drill to a company in California; 7 x 32-in. bench lathe to a Brooklyn manufacturer; duplex hand centering machine to a Reading, Pa., company three 8-in. rotary surface grinders to a gear manufacturer in New York State; 16 x 60-in. lathe to a California company; 27-in. x 12-ft. Time-Saver lathe to a Detroit automobile manufacturer; 42-in. rotary planer to a company in San Francisco.

Robert Gair Co., Graybar Building, New York, manufacturer of folding paper boxes, boxboard products, etc., is disposing of stock issue of $10,000,000, portion of proceeds to be used for expansion and improvements. Work is under way on addition to branch plant at Chicago to cost in excess of $250,000.

Best Die Casting & Stamping Corporation, 19 Thompson Street, New York, has leased space at 33 Grand Street for expansion.

Board of Estimate, Municipal Building, New York, has approved an appropriation of $500,000 for a municipal airport on Barren Island, including hangars, shops, oil storage and distributing plants, etc. Project will be in charge of Department of Plant and Structures.

S. Robert Schwartz & Brother, 546 Broadway, New York, manufacturer of electric lighting equipment and appliances, has leased two floors in twelve-story building at 160 Varick Street for expansion and will move to new location.

Seelig & Finkelstein, 44 Court Street, Brooklyn, architects, have plans for an automobile service, repair and garage building, 95 x 105 ft., at Coney Island Avenue and Avenue P, to cost close to $100,000 with equipment.

Quartermaster Supply Officer, Brooklyn, is asking bids until April 19 for grates and forced draft equipment for two 100 hp. boilers; also for two CO_2 indicating and recording meters for boiler units, circular 176.

Union School District, Elmont, N. Y., H. E. Foster, president, is considering installation of manual training equipment in new central high school at Floral Park, N. Y., to cost about $850,000. Knappe & Morris, 171 Madison Avenue, New York, are architects.

American Gas & Electric Co., 30 Church Street, New York, is disposing of a bond issue of $50,000,000, a portion of fund to be used for expansion and improvements, including acquisition of additional utilities. Company operates light and power plants in Pennsylvania, West Virginia, Tennessee, Indiana and other states.

Officials of Radio Corporation of America, Inc., Woolworth Building, New York, have organized R.C.A. Photophone, Inc., to manufacture synchronizing motion picture machines and devices, for "talking" motion pictures in homes. Gen. James G. Harbord, president of parent company, will be chairman of board of new organization; David Sarnoff will be president.

Van Alstyne Motor Corporation, 1871 Broadway, New York, representative for Hupmobile, has leased three floors and basement in new building at 239-49 West Sixty-sixth Street for main service and repair department, with parts and equipment divisions, etc.

Bayonne Steel Ceiling Co., 223 West Nineteenth Street, New York, will take bids at once for two-story plant at Long Island City, to cost approximately $75,000 with equipment. William Higginson, 101 Park Avenue, New York, is architect and engineer.

American Power & Light Co., a unit of Electric Bond & Share Co., 71 Broadway, New York, has purchased controlling interest in Montana Power Co., Butte, Mont., heretofore held by John D. Ryan, 25 Broadway, New York, for about $80,000,000. New owner will operate in conjunction with other properties in that district, including Washington Water Power Co., Spokane, Wash., lately secured. Extensions will be made in plants and transmission lines.

Portnow Lighting Fixture Co., New York, has leased building at 59 West Fourteenth Street for a new plant to manufacture electric lighting fixtures and devices.

Todd Shipyards Corporation, 25 Broadway, New York, will proceed with construction of new drydock with repair and shipbuilding facilities at Erie Basin, Brooklyn. It will be 715 ft. long and 113 ft. wide. Installation will include a main electrically-operated pumping plant with 600 hp. units, with hydraulically-operated sluice gates for drydock, etc. Entire project will cost about $2,000,000.

Bayonne Bolt & Nut Corporation, First Street and Trask Avenue, Bayonne, N. J., will rebuild portion of plant de-

stroyed by fire April 5, with loss reported in excess of $200,000 including equipment.

Zucker Sons Co., 228 Broadway, Elizabeth, N. J., manufacturer of metal-polishing and plating materials, will remove its plant to 627 First Avenue, Roselle, N. J., where site was recently acquired. First unit is ready for occupancy and other units will be established later.

American Oil Co., American Building, Baltimore, is considering erection of new one-story oil storage and distributing plant at Bridgeton, N. J., to cost more than $50,000 with equipment. T. J. O'Connell is company engineer.

Board of Education, Roselle, N. J., is considering installation of manual training equipment in three-story and basement high school to cost $275,000. F. A. Elsasser, Falls Building, Union, N. J., is architect.

Ajax-Brand Lock Corporation, 25 Warren Street, New York, has been organized to manufacture locks and kindred products. Work is being done by contract at present, but company expects to establish its own plant during year.

Latham-Litho Printing Co., Woodside, N. Y., has filed plans for erection of a two-story, 115 x 186 ft. addition. Lockwood, Greene & Co., Inc., New York, is engineer.

George Swan & Co., Inc., 500 Kindland Road, Nutley, N. J., has been organized and is engaged in bending pipe and tubing and light manufacturing. It is in market for pipe and tubing and some small machinery. Company is building some special machines of its own design.

Plant of Bayonne Bolt Corporation, Bayonne, N. J., was almost completely destroyed by fire on April 5, loss amounting to from $350,000 to $400,000. Company proposes to rebuild as soon as insurance can be adjusted and financial negotiations completed. Offices are at 117 Liberty Street, New York.

New England

BOSTON, April 9.

FEW important New England industrial companies are buying or inquiring for machine tools. A Rhode Island plant has under consideration a $7,000 lathe; a Massachusetts shop is reported about to close on a similar tool; the Boston & Albany Railroad has inquiries out for a number of tools, but will probably buy one at a time; the Boston & Maine and New Haven railroads are expected to purchase several high-priced tools this year. The Maine Central is still negotiating on a large tool, and there are a few active inquiries from other users, but no indications are given as to the time of closing.

Current business is mostly the result of active solicitation by dealers. Buying involves the general line of standard equipment. The Boston Elevated Railway Co. is in the market for considerable wood-working machinery. New England machine tool builders, with few exceptions, are quite busy on orders booked in other sections of the country, largely from the automobile trade. There is quite a little buying of grab buckets, concrete mixers, steam shovels, road machinery and other equipment, including pneumatic tools, in New England.

Connecticut plants with orders from Ford Motor Co. are exceptionally busy. Moore Drop Forging Co., Springfield, Mass., also is rushed on such work and is operating day and night shifts.

Work has started on a three-story, 60 x 100 ft., addition for Franks Brothers, Chandler Street, Lawrence, Mass. Motors and miscellaneous equipment are required. Herman Petzold, 712 Bay State building, Lawrence, is architect.

Bids are in for a one-story, 65 x 68 ft. addition for Haskell Mfg. Co., Commerce Street, Pawtucket, R. I., requiring miscellaneous mechanical and electrical equipment. Warren B. Lewis, 10 Weybosset Street, Providence, is engineer.

Atlantic Precision Co., Malden, Mass., weight meters, has been reorganized as Atlantic Precision Instrument Co., with 2500 shares, of no par value. Robert F. Herrick, Jr., is president. Plans are in progress for enlarging manufacturing facilities.

Massachusetts Electric Co., 11 Margin Street, Lynn, Mass., has started general repairs made necessary by a recent fire.

Independent Lock Co., 78 Winter Street, Fitchburg, Mass., has started work on a two-story, 40 x 154 ft., addition.

Cleverdon, Varney & Pike, architects, 46 Cornhill, Boston, closed bids April 9 for alterations for plant of Elliott Addressing Machine Co., 143 Albany Street, Cambridge, Mass.

Svensson & Berggren Co., 127 West Brookline Street, Boston, printer, has plans for a four-story, 30 x 60 ft., office and light manufacturing plant. Motors and other equipment are required. Clifford Allbright, 308 Boylston Street, Boston, is architect.

G. E. Hoglund Co., Gardner, Mass., foundry, has reincorporated under name of Donlan Foundry Co., Inc. There will be no change in personnel.

Holyoke Water Power Co., Holyoke, Mass., has secured permission to proceed with hydroelectric power project on Connecticut River, near Holyoke, for a capacity of 40,000 hp., to cost in excess of $450,000 with transmission lines.

Atwater Mfg. Co., Plantsville, Conn., manufacturer of drop forgings, has awarded general contract to H. Wales Lines Co., Meriden, Conn., for a one-story addition to cost more than $20,000 with equipment.

Cambridge Gas Light Co., 354 Third Street, Cambridge, Mass., has plans for a one-story machine shop.

New England Power Association, Worcester, Mass., operating light and power properties in Massachusetts, New Hampshire, Vermont and Rhode Island, is disposing of a bond issue of $25,000,000, a portion of proceeds to be used for extensions and improvements. It is reported considering construction of a hydroelectric power plant on Conecticut River, vicinity of Barnet, Vt., with capacity of 50,000 hp., to cost more than $650,000 with equipment; extensions will be made in transmission lines in that district.

E. F. Sharples, New Haven, Conn., has acquired plant and property of Connecticut Valley Trap Rock Co., Inc., Hartford, Conn., at a public sale. New owner is said to be planning improvements.

American Chain Co., Inc., Bridgeport, Conn., has acquired the plant and business of Wright Mfg. Co., Lisbon, Ohio, manufacturer of high speed hoists, trolleys, etc., and will operate as a division. W. F. Wright will continue in charge of production; H. F. Wright will also continue to be identified with company.

Simplex Wire & Cable Co., 201 Devonshire Street, Boston, has filed plans for extensions and improvements in plant at Cambridge, to cost about $18,000. Stone & Webster, Inc., 49 Federal Street, is engineer and contractor.

Connecticut Electric Service Co., Hartford, Conn., operating light and power utilities, has work under way on hydroelectric power development on Rocky River, near New Milford, Conn., for capacity of 24,000 kw. Construction will also proceed on a transmission line from Montville to Meriden, Conn., about 40 miles.

St. Louis

ST. LOUIS, April 9.

BIDS have been asked on revised plans by Independent Plumbing & Heating Supply Co., 1119 Chestnut Street, St. Louis, for a two-story storage and distributing plant, 170 x 249 ft., with pipe cutting and fitting and other mechanical departments, to cost about $125,000 with equipment. D. R. Harrison, Ambassador Building, is architect.

American Car & Foundry Co., Syndicate Trust Building, St. Louis, contemplates an addition to plant on Dorcas Street to cost more than $200,000 with equipment. Headquarters are at 30 Church Street, New York.

Chickasha Cotton Oil Co., Chickasha, Okla., has arranged for a stock issue to total $4,750,000, a portion of proceeds to be used for expansion and improvements.

Midwest Oil Co., Third and Central Streets, Kansas City, Kan., contemplates a new oil storage and distributing plant, to cost more than $40,000 with equipment.

White River Power Co., Boyle Building, Little Rock, Ark., Charles Jacobson, head, has secured a permit for a hydroelectric power development on White River and its forks, vicinity of Cotter, Ark., with capacity of 165,000-hp. A transmission line will be built. Entire project will cost more than $1,500,000.

Gill & Jackson, Buder Building, St. Louis, architects, will proceed with erection of two-story and basement building, 100 x 108 ft., to be leased by B. F. Goodrich Co., Akron, Ohio, for a factory branch and distributing plant. It will cost about $100,000 with equipment.

Ira Varnell, head of Varnell Lumber Co., Hampton, Ark., plans construction of power house and system for local commercial service, to cost about $40,000 with equipment.

Industrial Gas Co., 801 Board of Trade Building, Kansas City, Mo., is planning for a natural gas plant and pipe lines in different parts of State. Company plans bond issue of $1,500,000, majority of proceeds to be used for project.

Baldwin Harvester Co., 432 South Wichita Street, Wichita, Kan., agricultural equipment, has plans for a one-story addition, 63 x 100 ft., portion of structure to be used for storage and distribution.

Jamieson & Spearl, Arcade Building, St. Louis, architects, have plans for a two-story automobile service, repair and garage building, to cost approximately $100,000 with equipment.

The Crane Market

THERE is but little new inquiry for electric overhead cranes, but the locomotive crane market is quite active. In addition to the cranes under inquiry by the Amtorg Trading Corporation and the list of seven 15-ton crawl tread locomotive cranes and six steam shovels from Dwight P. Robinson & Co., New York, for a contract at Buenos Aires, Argentina, there is a list of five 10-ton locomotive cranes, capable of 10 miles per hr. for the Boston & Maine Railroad.

Among recent purchases are:

Delaware, Lackawanna & Western Railroad, New York, 20-ton locomotive crane from the Browning Crane Co. and a 40-ton traveling gantry crane, reported purchased from the Whiting Corporation.

E. I. du Pont de Nemours & Co., Wilmington, Del., a 15-ton, 2-motor overhead crane reported purchased from the Niles Crane Corporation.

Nugent Sand Co., Muskegon, Mich., 25-ton steam-operated locomotive crane from the Orton Crane & Shovel Co.

Samuel Olson Co., Chicago, 3-ton, 3-motor, floor-operated crane from H. D. Conkey & Co.

St. Louis Contracting Co., St. Louis, 3-ton electric bridge crane from H. D. Conkey & Co.

J. S. Kirk & Co., Chicago, two 5-ton double-girder cranes from H. D. Conkey & Co.

International Harvester Co., Rockford, Ill., two 2-ton special underhung and two electric follow-up cranes from H. D. Conkey & Co.

Midwest Piping & Supply Co., 1452 South Second Street, St. Louis, manufacturer of pipe, pipe fittings, etc., has awarded general contract to James H. Bright Construction & Building Co., Arcade Building, for a one-story addition, 45 x 120 ft., to cost close to $50,000 with equipment. Klipstein & Rathman, Security Trust Building, are architects.

Paxton-Mitchell Co., 2614 Martha Street, Omaha, Neb., has filed plans for a one-story and basement foundry, 92 x 165 ft., for production of iron castings, to cost $50,000 with equipment.

Board of Education, Fullerton, Neb., is planning installation of manual training equipment in three-story and basement high and grade school to cost $150,000, for which bids are being asked on general contract until April 19. Meginnis & Schaumberg, Federal Trust Building, Lincoln, Neb., are architects.

A. R. Pannell Machinery Co., Inc., 33 East Grand Avenue, Oklahoma City, Okla., dealer in heavy machinery and steam, oil and electric power plant equipment, is adding a stock of mill supplies.

Cleveland

CLEVELAND, April 9.

WHILE machine tool business is fair, April is not starting out quite as well as March. A Michigan manufacturer of automobile parts is in the market for 30 or more high-grade used tools for work on wheels and brakes for Ford automobiles. The requirements include turret lathes, punch presses, drilling and grinding machines. The Dana Mfg. Co., Toledo, has purchased milling and other machines for manufacturing shock absorbers for Ford cars and still has some equipment to place. Locally, single tools are in fair demand. Turret lathes continue to move well in single unit orders. Railroad inquiry is confined to single machines.

Plans are being arranged by White Chevrolet Co., South Third Street, Zanesville, Ohio, local representative for Chevrolet automobile, for five-story service, repair and garage building, to cost about $100,000 with equipment.

City Council, Akron, Ohio, has approved bond issue of $900,000 for a municipal airport, providing for purchase of 500-acre site in vicinity of Fulton Field, and construction of hangars, repair shops, oil storage and distributing plant, etc., for which plans will soon be drawn.

G. Schaefer Wagon Co., 4180 Lorain Avenue, Cleveland, has awarded general contract to G. A. Rutherford Co., 2725 Prospect Avenue, for rebuilding four-story automobile body and wagon plant recently destroyed by fire, to cost close to $135,000 with equipment. W. S. Longee, Marshall Building, is architect.

Federal Radiator & Boiler Co., Zanesville, Ohio, is said to have plans for a one-story plant at Licking View, to replace portion of works recently destroyed by fire, with loss close to $90,000 including equipment.

Heller Brothers Co., 879 Mount Prospect Avenue, Newark, N. J., manufacturer of files, rasps, tools, etc., will build a one-story plant, totaling about 35,000 sq. ft. floor space, at Newcomerstown, Ohio, vicinity of works of Rex File and Vixon Tool companies, subsidiaries. It will cost more than $75,000 with equipment. A portion of machinery will be removed from Newark plant.

Hercules Motors Corporation, Halliwell Place, S. E., Canton, Ohio, manufacturer of gasoline and oil engines, etc., is said to be completing plans for rebuilding one-story unit recently destroyed by fire, to cost about $55,000 with equipment.

Wright Mfg. Co., Lisbon, Ohio, manufacturer of hoists and trolleys, has sold its business and trade name to American Chain Co., Inc., Bridgeport, Conn. No changes in policies or sales organization are anticipated.

Gulf States

BIRMINGHAM, April 9.

PLANS are being arranged by Texas Utilities Co., Plainview, Tex., for a new super-power steam-operated electric generating plant for service in Panhandle and eastern New Mexico districts, to cost in excess of $400,000 with transmission lines.

Pasotex Pipe Line Co., El Paso, Tex., operated by Pasotex Petroleum Co., same city, subsidiary of Standard Oil Co. of California, 225 Bush Street, San Francisco, plans installation of electrically-operated pumping plant at Wink, Tex., and three booster stations, with Diesel engine and auxiliaries, in connection with proposed pipe line from El Paso to Wink. Line will have capacity of 17,000 bbl. daily and will cost in excess of $2,500,000.

Texas Gulf Sulphur Co., 41 East Forty-second Street, New York, has taken over properties at Boling Dome, Tex., and will install equipment for sulphur mining, including transportation facilities.

Southern Ornamental Iron Works, 2425 South Harwood Street, Dallas, Tex., has awarded a general contract to Churchill-Humphrey Co., Burt Building, for new one and two-story plant, 100 x 310 ft., at Arlington, Tex., to cost more than $70,000 with equipment.

Black Donald Graphite Co., Florence, Ala., is considering rebuilding of portion of mill recently destroyed by fire with loss reported at close to $65,000 including equipment.

Gulf Power Co., Pensacola, Fla., has arranged for bond issue of $2,500,000, a portion of fund to be used for expansion and improvements, including new transmission lines.

Clarence W. King, Giddens-Lane Building, Shreveport, La., architect, will soon take bids on general contract for a two-story automobile service, repair and garage building, 115 x 150 ft., to cost about $90,000 with equipment.

Notros Hangar Corporation, 3609 McKinney Avenue, Houston, Tex., Harry E. Weaver, president, recently organized, will operate a plant for manufacture of steel aircraft hangars and kindred equipment.

June Machinery Co., Waco, Tex., D. June, head, has plans for a one-story foundry at 208 South First Street, to cost about $21,000 with equipment.

Crawford's Auto Shop, Inc., 2227 North First Avenue, Birmingham, has completed plans for a two-story repair, service and garage building, 140 x 150 ft., to cost more than $70,000 with equipment. William L. Welton, American Trust Building, is architect.

H. L. Luckett and associates have acquired Corpus Christi Foundry & Machine Co., Corpus Christi, Tex. An expansion and improvement program will be carried out. Company will be reorganized as Luckett Foundry & Machine Co.

Dixie Gas & Fuel Co., Houston, Tex., operating natural gas properties, is said to be planning a bond issue of $25,000,000, a portion of proceeds to be used for expansion and improvements, including pipe line construction.

Roxanna Petroleum Corporation, Shell Building, St. Louis, is reported planning construction of a new oil refinery in vicinity of Houston, Tex., to cost in excess of $250,000 with equipment. A right-of-way has been secured from McCamey, Tex., for a 10-in. welded steel pipe line to refinery site. Plans have been approved for oil storage and distributing plant at McCamey, to cost more than $175,000.

Graybar Electric Co., Graybar Building, New York, electrical equipment and supplies, has leased a two-story

building, 50 x 175 ft., to be erected at 1521 North First Avenue, Birmingham, to cost $40,000, for a new storage and distributing plant. Local headquarters are at 1529 North First Avenue. Charles M. McCauley, Jackson Building, is architect.

Harvey M. Mansfield, 3032 Spruce Street, Tampa, Fla., is at the head of a project to construct and operate a mill in this vicinity for pulp and kraft paper manufacture. Inquiries are being made for equipment.

Humble Oil & Refining Co., Houston, Tex., is reported planning a new pipe line from Pierce Junction, Tex., terminus of present line, to a point near Sugarland, Tex., to cost close to $100,000.

St. Tammany Parish School Board, Covington, La., is said to be planning installation of manual training equipment in a two-story high school addition to cost $135,000, for which bids will be asked on general contract early in May. William T. Nolan, Canal Bank Building, New Orleans, is architect.

Momsen, Dunegan & Ryan, El Paso, Tex., hardware products, have plans for a four-story storage and distributing plant, to cost $125,000 with equipment.

Philadelphia

PHILADELPHIA, April 9.

PLANS are being considered by Reading Coal & Iron Co., Reading Terminal, Philadelphia, for complete electrification of anthracite coal-mining properties at Hazleton, Wilkes-Barre and vicinity, including installation of motors, hoists, controls, etc. Negotiations are under way for central station service from Pennsylvania Power & Light Co., Allentown, Pa., which will build lines to different properties.

U. S. M. C. Garages, Inc., 1401-7 Locust Street, Philadelphia, has engaged M. A. Bernhardt, 127 South Eighteenth Street, architect, to prepare plans for a three-story addition to service, repair and garage building at Broad and Pine Streets, to cost $110,000 with equipment.

Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has awarded contract to Sinclair & Grigg, 1518 Walnut Street, for a new coal pier, 900 ft. long, at Greenwich Point, and will install mechanical conveying, hoisting and kindred equipment. William H. Cookman is company architect.

Philadelphia Rural Transit Co., subsidiary of Philadelphia Rapid Transit Co., 810 Dauphin Street, Philadelphia, has secured garage and adjoining structures of Commercial Truck Co., now in receivership, totaling 110,000 sq. ft. floor space, and will remodel and equip for new motor bus service, repair and garage building. A complete maintenance division will be installed.

Allegheny Wagon & Truck Co., Inc., Philadelphia, recently organized, will take over and expand company of same name at 1733-37 North Front Street, specializing in manufacture and repair of motor trucks, wagons, etc., and motor truck bodies.

Electric Coil Winding Co., 2101 Federal Street, Camden, N. J., has awarded general contract to Charles B. Coe, 120 West Irving Avenue, Merchantville, N. J., for a one-story addition, 49 x 59 ft., to cost about $18,000 with equipment.

Audubon Wire Cloth Co., Audubon, N. J., has awarded contract to J. D. Lawrence, Westville, N. J., for a two-story and basement addition, 55 x 100 ft., to cost about $30,000 with equipment.

Board of Education, South Fayette Township, Sturgeon, Pa., P. H. Walker, president, is considering installation of manual training equipment in high school near Bridgeville, Pa., to cost $200,000. Laurie Green & Co., Third and Forster Streets, Harrisburg, Pa., are architects.

Metropolitan Edison Co., Reading, Pa., has secured permission to take over and consolidate 11 electric light and power companies in Adams, Chester, Dauphin, Berks, Lehigh and Lebanon Counties, for total consideration of $2,401,192. Extensions and improvements will be carried out, including transmission line construction. Purchasing company recently disposed of bond issue of $23,000,000, portion of fund to be used for expansion.

Gordon Nagle, Pottsville, Pa., has organized a company to construct and operate a local mill for fabricating light structural steel. A site, 150 x 300 ft., has been secured, and plant will soon be built.

Lancaster Advertising Poster Co., Lancaster, Pa., has awarded general contract to W. B. Aierstruck, 34 East Chestnut Street, for a one and two-story sign and electric display manufacturing plant, 50 x 150 ft., to cost more than $20,000 with equipment. H. Y. Shaub, 20 North Queen Street, is architect.

In connection with new three-story engineering building at University of Delaware, Newark, Del., Board of Trustees has authorized installation of following departments, for which equipment will be arranged at early date: Foundry forge shop, machine shops, electrical laboratory, woodworking shop, highway and test laboratory, blue-printing department, gas and steel laboratory, and experiment rooms. Structure will cost about $200,000. Charles Z. Klauder, Franklin Bank Building, Philadelphia, is architect.

General Cement Corporation has been organized to take over and consolidate Pennsylvania-Dixie Cement Corporation, Nazareth, Pa., and North American Cement Corporation, Albany, N. Y. First-noted company is now operating seven mills with gross output of 10,000,000 bbl. per annum, and other organization is running three mills with rating of 4,500,000 bbl. per year. Pennsylvania-Dixie company has recently concluded negotiations for purchase of plant and business of Pyramid Portland Cement Co., Valley Junction, near Des Moines, Iowa, and latter interest will be included in merger. Consolidated company will carry out general expansion and improvement program. All mills are scheduled to be continued in service.

American Machinery Corporation, 1120 Vine Street, Philadelphia, has been organized to succeed American Machinery Co., Inc., and to manufacture products formerly made by that company, American Fruit Machinery Co. and American Paring Machine Co. It will not build a plant, but will continue assembling machines at present location.

Hazard Wire Rope Co., Wilkes-Barre, Pa., has been licensed by American Cable Co., Inc., Chicago, to manufacture Tru-Lay Preformed wire rope and Tru-Loc Processed fitting.

Pittsburgh

PITTSBURGH, April 9.

DULLNESS which set in about the middle of last month in machine-tool sales continues, but inquiry still is fairly active and the majority of the trade reports sales so far this year as making a favorable comparison with the same period in 1927. Homestead Valve Mfg. Co., which will move from Homestead, Pa., to Stoops Ferry, Pa., is a possible buyer of a few tools to supplement those to be moved from the old to the new plant.

Homestead Valve Mfg. Co., Homestead, Pa., has acquired and will occupy former plant of Sewickley Electric & Mfg. Co., Stoops Ferry, Pa. Sewickley company grew out of John W. Semple & Co., Sewickley, manufacturers of time fuses. Purchase includes plant containing 50,000 sq. ft. of floor space, and 108 acres.

Contract has been let by Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, to C. W. & P. Construction Co., Akron, Ohio, for a two-story addition to plant at Barberton, Ohio, to cost about $50,000. J. F. Suppes, Akron Savings & Loan Building, Akron, is architect.

Cyclone Fence Co., Waukegan, Ill., manufacturer of iron and wire fencing, has secured property at 909 Behan Street, Pittsburgh, for a new factory branch and distributing plant. J. H. Laughlin will be branch manager.

J. & J. B. Milholland Co., 714 Fifth Avenue, Pittsburgh, manufacturer of engines, mine cages, etc., plans rebuilding portion of machine shop destroyed by fire April 4, with loss close to $35,000 including equipment.

Lawson Mfg. Co., Lexington Avenue and Thomas Boulevard, Pittsburgh, manufacturer of heaters and heating equipment, has awarded general contract to Donald Ranolla & Son, Cedarville Street, for a one-story addition, 50 x 275 ft., to cost about $50,000 with equipment. Bernard H. Prack, Martin Building, is architect and engineer.

Charleston-Dunbar Natural Gas Co., 1023 Quarrier Street, Charleston, W. Va., is considering an expansion and improvement program in pipe lines and properties to cost $100,000. John P. Chenoweth is representative.

Gellatly & Co., Inc., Oliver Building, Pittsburgh, manufacturer of mine equipment, has leased a factory on Grand Avenue, Neville Island district, for establishment of a new plant unit for increased output.

Charles G. Hanny and Walter H. Stifel, 1034 Murray Hill Avenue, Pittsburgh, have organized Charles G. Hanny & Co., with capital stock of $25,000, to establish and operate a plant for manufacture of light structural steel and ornamental iron products. A department for wire work will be provided.

Board of Education, Glassport, Pa., is considering installation of manual training equipment in three-story high school to cost about $180,000, for which bids are being asked on general contract. H. C. Clepper, Century Building, Pittsburgh, is architect.

Crystal Oil Works, Rouseville, near Oil City, Pa., are planning to rebuild portion of oil refinery destroyed by fire April 3, with loss close to $30,000 with equipment. Damaged section was used largely for wax and kindred production.

Detroit

DETROIT, April 9.

CONTRACT has been let by Chevrolet Motor Co., Flint, Mich., to H. G. Christman Co., Lansing, for a one-story plant unit at Bay City, Mich., to cost more than $400,000 with machinery. Wright & Nice, 4339 South Saginaw Street, Flint, are architects.

Board of Education, Muskegon, Mich., has approved plans for an addition to Hackley Manual Training School to cost in excess of $100,000. Frank F. Forster, Muskegon, is architect.

Detroit City Service Co., Lafayette Building, Detroit, will build a new two-story ice-manufacturing plant, to cost about $65,000 with equipment.

Arthur Corbeille, Ypsilanti, Mich., has plans for a one-story foundry for manufacture of iron castings, to cost about $22,000.

Board of Education, Battle Creek, Mich., is considering installation of manual training equipment in a new junior high school to cost close to $500,000. William B. Ittner, Board of Education Building, St. Louis, is architect.

Falcon Mfg. Co., Big Rapids, Mich., manufacturer of furniture, is planning to rebuild its No. 2 plant, recently partially destroyed by fire, with loss close to $50,000 with equipment.

White Co., East Seventy-ninth Street, Cleveland, manufacturer of motor trucks, is planning a one-story factory branch, service and repair station, 185 x 200 ft., at Detroit, to cost about $135,000 with equipment.

Motor Wheel Corporation, Lansing, has remodeled one of its plant units for production of wire wheels for automobiles, a new development for company, which heretofore has specialized in disk steel and wood wheels. It is proposed to increase wire wheel department later.

Electric Steel Castings Co., St. Joseph, Mich., recently organized, will operate a plant for production of small electric steel castings, weighing up to 45 and 50 lb. Operations will soon begin.

Mount Clemens Gas Co., Mount Clemens, Mich., is completing plans for an addition to its gas-generating plant, to cost close to $200,000 with equipment. It will also make extensions in lines to cost about $100,000. C. S. Holt is general manager.

King-Seeley Co., Ann Arbor, manufacturer of gasoline gages and kindred equipment, has awarded general contract to Townsend-Dailey Co., 213 West Michigan Avenue, Ypsilanti, Mich., for a five-story addition, 65 x 85 ft., to cost close to $100,000 with equipment.

Florin Mfg. Co., Carson City, Mich., has been organized to manufacture washing machines and furniture specialties and will erect factory immediately.

North-Moller Co., Jackson, Mich., has been awarded contract for an addition to plant of Sparks-Withington Co., Jackson, manufacturer of automobile horns and radio receiving sets. It will be two stories, 60 x 260 ft., with separate boiler house. Lockwood, Greene & Co., Inc., Cleveland, is engineer.

L. A. Young Industries, Detroit, has changed its name to L. A. Young Spring & Wire Corporation.

South Atlantic States

BALTIMORE, April 9.

RECENTLY organized Dixie Aircraft Corporation, care of I. L. Paisley, Frederick, Md., is said to be planning establishment of new plant in vicinity of Lynchburg, Va., for manufacture of all-metal monoplanes and parts. It is understood that motors will be secured from outside sources.

Common Council, Lexington, Va., is reported planning installation of municipal power plant, to cost upward of $25,000 with equipment.

Suburban Light & Power Co., Cambridge, Md., George W. Woolford, president, recently organized, has secured permission to construct power substations and transmission lines in portions of St. Mary's, Charles and Prince George's Counties, totaling 80 miles, to cost in excess of $125,000. Authority has been granted also for issuance of preferred stock to total $250,000 and 1000 shares common stock, no par value, proceeds to be used in part for expansion.

Bureau of Yards and Docks, Navy Department, Washington, is asking bids (closing date not specified) for refrigerating plant for Mare Island Navy Yard hospital, including motor-driven compressors, condensers, liquid receivers, expansion coils and accessories.

Superintendent, National Training School for Boys, Bladenburg Road, N. E., Washington, is asking bids until April 16 for material for complete 9-ft. high, chain link wire fence, No. 6 gage wire.

Blue Ridge Power Co., Manassas, Va., is planning installation of additional equipment at power plant, including water wheel, generator and accessories.

Board of City Commissioners, Kings Mountain, N. C., plans installation of pumping machinery and other power equipment in connection with extensions and improvements in municipal waterworks to cost $250,000. Carolina Engineering Co., Wilmington, N. C., is engineer.

Morocto Roofing Co., Rowlandsville, Md., manufacturer of roofing products, will rebuild portion of plant destroyed by fire April 5, with loss reported in excess of $350,000 including equipment.

Purchasing section, Bureau of Standards, Washington, is asking bids until April 27 for furnaces, pulverizers, burners and auxiliary equipment for new power plant.

Cocker Machine & Foundry Co., Gastonia, N. C., manufacturer of cotton mill machinery, castings, etc., plans construction of two one-story additions, 60 x 100 ft., and 40 x 60 ft. It is understood that standardized steel buildings will be selected.

Southeastern Power & Light Co., Birmingham, affiliated with Alabama Power Co., and other utilities, has purchased Edisto Public Service Co., Denmark, S. C., operating in 16 communities in that State. New owner plans expansion, including transmission line construction to connect with system in Georgia. Edisto company has work under way on a hydroelectric power project at Clarks Hill, on Savannah River, which will be completed by Southeastern company, to cost more than $5,000,000.

Common Council, Nashville, Ga., has sold municipal electric light and power plant to new interests, headed by Roger C. Bauman. Plans are under way for extensions and betterments, including installation of 350-hp. Diesel engine unit and other equipment. It is understood that Southeast Georgia Power Co. is interested in plant purchase.

Board of Education, Roanoke, Va., is considering installation of manual training equipment in three-story junior high school to cost about $150,000, for which superstructure will soon be started. H. M. Miller, Shenandoah Life Building, is architect; Charles S. Churchill, Liberty Trust Building, is consulting engineer.

Duke Power Co., Charlotte, N. C., has approved plans for first unit of new steam-operated electric power plant at River Bend on Catawba River, near Mount Holly, to be equipped for capacity of 150,000 hp. and to cost more than $2,000,000 with transmission lines. Station will be designed to use pulverized coal. Later plant will be enlarged with three other units for total rating of 600,000 hp., and ultimate cost of close to $10,000,000.

Buffalo

BUFFALO, April 9.

PROPERTY at 550 Abbott Road, Buffalo, has been leased by General Aircraft Corporation, recently organized, for a new plant for production of airplane parts and assembling. This plant will be temporary, it is said, pending selection of site for erection of new works. G. MacLean Gardner, formerly engineer for Fokker Aircraft Corporation, Hasbrouck Heights, N. J., will be general manager. It is reported that company is identified with General Motors Corporation, Detroit, and will become airplane production division of that organization. George H. Hannum, formerly president of Oakland Motor Car Co., Pontiac, Mich., is president of new company.

Morse Chain Co., Ithaca, N. Y., manufacturer of silent chain drives, etc., has disposed of a new bond issue of $2,000,000, a portion of proceeds to be used for general expansion.

American-La France & Foamite Industries, Inc., Elmira, N. Y., has been organized with capital stock of $100,000 by officials of American-La France Fire Engine Co., Elmira, manufacturer of motor-driven fire equipment, to take over and consolidate that company with other acquired interests in similar line of production, including Foamite-Childs Corporation, Utica, N. Y. An expansion program will be carried out.

Fairbanks Co., Glenwood Avenue, Binghamton, N. Y., and Broome and Lafayette Streets, New York, manufacturer of valves and other mechanical equipment, is reported to be arranging for a two-story plant unit, to cost about $125,000 with equipment, to replace its local works recently destroyed by fire.

Certain-Teed Products Corporation, 100 East Forty-second Street, New York, manufacturer of roofing products, gypsum specialties, etc., has concluded arrangements for purchase of Beaver Board Companies, Inc., Beaver Road, Buffalo, manufacturer of wallboard products, and will operate as a division. Increased production is planned. Purchasing com-

pany has arranged for bond issue of $13,500,000, and common stock issue of 93,000 shares, no par value. George M. Brown is president of Certain-Teed company.

Afga-Ansco Mfg. Co., 23 Charles Street, Binghamton, N. Y., manufacturer of cameras, tripods and other photographic equipment, formed by recent merger of Ansco Photo Products, Inc., Afga Products, Inc., and Afga Raw Film Co., is planning an early call for bids on general contract for a two and three-story addition, to cost in excess of $500,000 with equipment. Otto S. Schlick, 136 Liberty Street, New York, is engineer.

Garlock Packing Co., Palmyra, N. Y., will erect power plant to replace old unit at its factory. Two 550-hp. boilers will take place of eight boilers now in use and two turbo generators will provide electric current. Sigmund Firestone, Rochester, N. Y., will supervise building.

Buffalo Foundry & Machine Co., Buffalo, has acquired entire assets of Chemical & Vacuum Machinery Co., local, and will supplement Buflocak and Buflokast lines of dryers and evaporators with several new types. Included will be spray film feed applicable to both vacuum and atmospheric drum dryers, new design of vacuum rotary dryer and other modifications of present types.

William Summerhays Sons Corporation, Rochester, N. Y., has moved its offices to warehouse at 614 Clinton Avenue South.

Chicago

CHICAGO, April 9.

IN machine tool sales, March was not only the best month so far this year, but is also ahead of the corresponding period in 1927 and, with several dealers, the best month since 1920. This record has been made in the almost total absence of railroad buying. The Santa Fe list is dormant, but it is reported that the Rock Island will soon come into the market for machine tools. The Union Pacific list shows equipment worth $200,000 and subsidiary lines of that railroad are still to be heard from.

A forging plant in Chicago has taken a 30 x 30-in. x 8-ft. planer and an Illinois watch maker has purchased two 12-in. x 5-ft. lathes and a 14-in. x 6-ft. lathe. Tractor plants are active buyers.

General Electric Co., Milwaukee, is asking for prices on following list:

Two power hack saws.
One 28-in. shaper.
One No. 2 universal miller.
One 36-in. x 16-ft. lathe.
One 18-in. x 12-ft. lathe.
One 2-ft. radial drill.
One 3-ft. radial drill.
One 24-in. drill.
One floor grinder.
Several wood-working machines.

Wyckoff Drawn Steel Co., 2300 South Kedzie Avenue, Chicago, will build a warehouse, 50 x 150 ft., to cost $10,000. W. M. Wood, 208 South LaSalle Street, is architect.

Contract has been let by Glabman Brothers, Inc., 832 Maxwell Street, Chicago, manufacturer of furniture, to H. M. Lipman, 5079 West Monroe Street, for a new four-story and basement plant, 50 x 100 ft., to cost close to $150,000 including equipment. Dubin & Eisenberg, 14 West Washington Street, are architects.

Bassick Mfg. Co., 2638 North Crawford Avenue, Chicago, manufacturer of lubricating equipment and devices, subsidiary of Stewart-Warner Speedometer Corporation, 1828 Diversey Parkway, is planning an addition to increase capacity about 25 per cent, to cost $300,000 with machinery.

Greenleaf-Glenwood Garage Corporation, 924 Ainslie Avenue, Chicago, Samuel Wanig, head, has plans for a four-story service, repair and garage building to cost in excess of $200,000 with equipment. Rissman & Hirschfield, 228 North LaSalle Street, are architects.

Olson Mfg. Co., Albert Lea, Minn., manufacturer of farm equipment, is having plans completed for a one-story and basement addition, to cost close to $30,000 with equipment. Toltz, King & Day, Inc., Builders' Exchange, St. Paul, Minn., is architect.

Minnesota Power & Light Co., Duluth, Minn., is disposing of bond issue of $14,000,000, a portion of fund to be used for expansion and improvements, including transmission line construction.

Great Northern Railway Co., Railroad Building, St. Paul, Minn., has plans under way for a new engine house, with machine shop and other repair facilities, 90 x 250 ft., at Grand Forks, N. D., to cost in excess of $90,000 with equipment. T. D. McMahon is company architect.

Reiter Co., Elgin, Ill., manufacturer of water softeners and kindred equipment is reported planning a two-story addition to cost more than $40,000.

United States Engineer, Peoria, Ill., is asking bids until April 19, for one force pump, circular 24.

Southern Colorado Power Co., Fourth and Main Streets, Pueblo, Colo., is planning an expansion program, including transmission line construction, to cost close to $250,000. A new power line will be built from Penrose to Beaver Park.

Holly Sugar Corporation, Colorado Springs, Colo., operating beet sugar mills, has arranged for bond issue of $6,500,000, a portion of proceeds to be used for expansion and improvements. Plans are in progress for betterments in refinery at Torrington, Wyo., including installation of additional machinery, to cost $200,000.

Jefferson Ice Co., 1515 Bickerdike Avenue, Chicago, has plans for a one-story ice-manufacturing plant, to cost more than $45,000 with equipment. G. L. Lehl, 3810 Broadway, is engineer.

Allied Industrial Products Co., 120 North May Street, Chicago, manufacturer of grinding wheels, buffing equipment, etc., has awarded general contract to Freevoll & Smedberg, 5950 West Erie Street, for a three-story and basement plant unit, 40 x 105 ft., to cost close to $80,000 with equipment. Meyer & Cook, Tower Court, are architects.

M. A. Erickson, operating Rugby Light & Power Co., Rugby, N. D., plans extensions and improvements in steam-operated electric power house at Westhope, N. D., including installation of engines and other equipment.

National Wire Cloth & Iron Works, Inc., St. Paul, Minn., has been formed to manufacture wire cloth and do ornamental iron and wire work. Company has own plant and equipment and has been in operation since March 15.

Cincinnati

CINCINNATI, April 9.

REPORTS from local machine-tool builders show considerable irregularity in sales. In the first week of April some manufacturers have bettered their March record, while others have suffered a decline. However, the consensus of opinion is that bookings this month will be from 85 to 90 per cent of those in March. Decreased buying by automobile makers is expected to account in large part for the anticipated inability to attain last month's volume of business during April. The McClintic-Marshall Co. of California, San Francisco, has purchased a 42-in. rotary planer, and Charles E. Larson & Co., Chicago, have bought a 1500-lb. single frame steam hammer.

Plans are being drawn by Star Foundry Co., Covington, Ky., manufacturer of gray iron castings, for a one-story addition, 60 x 62 ft., to cost about $25,000 with equipment. Howard McClorey, 211 East Fourth Street, Cincinnati, is architect.

Ferro Concrete Co., Third and Elm Street, Cincinnati, has taken contract for erection of nine-story automobile service, repair and garage building, 100 x 200 ft., to cost in excess of $850,000, with equipment.

Miami Development Co., Dayton, Ohio, O. E. Howland, Dayton Power & Light Co., treasurer, has acquired property on Eaker Street as site for a multi-story cold storage and refrigerating plant, to cost upward of $150,000 with equipment.

Air Corps, Material Division, Wright Field, Dayton, Ohio, is asking bids until April 17 for 46,000 copper asbestos annular gaskets, 125,000 machine nuts, 500,000 brass grommets and 5000 Woodruff keys, circular 290; on April 23 for 1000 Liberty engine exhaust valves, circular 294, and on April 27 for one heavy-duty portable refueling unit, circular 293.

Post Sign Co., 514 Watauga Avenue, Knoxville, Tenn., Edward L. Hicks, head, plans erection of one-story sign and display manufacturing plant to cost about $18,000 with equipment.

Board of Education, Nashville, Tenn., is considering installation of manual training equipment in two-story junior high school for which general contract has just been let to Foster & Creighton Co., Bennie-Dillon Building, to cost $160,000.

Cincinnati Gas & Electric Co., Cincinnati, is arranging for bond issue of $35,000,000, a portion of proceeds to be used for extensions and betterments, including transmission line construction.

Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, will soon take bids for a two-story and basement factory branch and distributing plant, 100 x 100 ft., at Nashville, Tenn., to cost about $85,000 with equipment.

City Machine Tool Co., Third and June Streets, N. W., Dayton, Ohio, has awarded general contract for one-story addition to J. C. Gohn, Dayton.

Department of Public Service, Knoxville, Tenn., W. W. Mynatt, director, has received low bid on general contract from Emory Construction Co., Empire Building, for a one-story municipal service, repair and garage building, 50 x 300 ft., with capacity of 60 cars, to cost approximately $100,000 with equipment. A traveling crane will be installed. L. M. Dow, Brownlow Building, is architect.

Farnsworth-Evans Co., Cotton Exchange Building, Memphis, Tenn., plans construction of one-story unit, 269 x 1325 ft., to cotton compress plant in Holleywood district, to cost $350,000 with machinery. George Mahan, Jr., American Bank Building, is associate architect.

Webster Mfg. Co., Chicago, maker of elevating, conveying and power transmitting machinery, is moving its Cincinnati office from 1914 Union Central Building to 503 Chamber of Commerce Building. L. A. Scheck is in charge.

Indiana

INDIANAPOLIS, April 9.

A NEW company, Eaglesfield-Link Co., with capital stock of $40,000, has been formed by R. D. Eaglesfield, Brazil, and associates, to establish and operate a plant for manufacture of a patented molding machine, recently invented by Mr. Eaglesfield. Dick Link, Brazil, is also interested in organization.

Truck Engineering Co., East Pontiac Street, Fort Wayne, manufacturer of motor truck equipment, has awarded general contract to Buesching, Hagerman & Co., 402 East Superior Street, for a one-story, sawtooth roof type addition, 60 x 100 ft., to cost more than $60,000 with equipment. Guy Mahurin, Standard Building, is architect.

Montgomery Ward & Co., Chicago Avenue, Chicago, operating a mail-order business, will soon take bids for a one and three-story and basement storage and distributing plant at Evansville, 160 x 310 ft., and 180 x 190 ft., to cost approximately $300,000 with equipment. A. E. Neucks, Old National Bank Building, Evansville, is architect.

Martin-Parry Corporation, 1100 West Henry Street, Indianapolis, manufacturer of commercial automobile bodies, is reported planning a one-story addition to cost more than $30,000 with equipment. Headquarters are at York, Pa.

City Council, Fort Wayne, is said to have approved plans for extensions and improvements in municipal electric light and power plant, to cost in excess of $200,000 with equipment. Froehleich & Emery Engineering Co., Second National Bank Building, Toledo, Ohio, is engineer, in charge.

Automotive Syndicate, Ltd., Indianapolis, recently organized, has leased a portion of former local plant of National Automobile Co., and will establish a factory for manufacture of patented steam-propelled buses, with capacity of about 40 passengers. A complete experimental plant will be installed for initial service. W. J. Parrish and D. McCall White head organization, last noted will be engineer for company. H. W. Alden, chairman of board, Timken-Detroit Axle Co., 200 Clark Avenue, Detroit, is said to be interested in new organization.

E. F. Miller, Farmers' Trust Building, Anderson, architect, will take bids at once on general contract for a two-story and basement automobile service, repair and garage building, 85 x 125 ft., at Logansport, to cost approximately $95,000 with equipment.

Milwaukee

MILWAUKEE, April 9.

ACTIVITY in the machine-tool market is well sustained by orders for one or two machines from diversified sources. A moderate aggregate is the result, and it enables tool builders to keep production at the previously established rate, which is higher than at this period last year. Replacement business predominates and there is a relatively good demand for milling machines with special tooling. Prospects are for improvement in industrial construction.

Board of Regents, University of Wisconsin, Madison, Wis., has instructed Arthur Peabody, State architect, to proceed with plans for a new mechanical engineering building costing $577,000. It will be first unit of a new group for College of Engineering. Other units will be built for electrical engineering, mining engineering, chemical engineering and material testing laboratory departments. Work on first unit is expected to start by June 1. M. E. McCaffrey is secretary of board. An appropriation of $88,500 for new boiler equipment for central heating plant has also been authorized. Specifications will be issued shortly.

Common Council, Waukesha, Wis., is about to call for bids for construction of a complete sewage disposal plant to cost $200,000, designed by Alvord, Burdick & Howson, consulting engineers, 8 South Dearborn Street, Chicago. T. C. Martin is city clerk.

Walter Gerlinger, 403 Sixty-sixth Street, Wauwatosa, suburb of Milwaukee, formerly of Gerlinger Electric Steel Casting Co., has incorporated as Walter Gerlinger, Inc., to deal in foundry supplies, including molding, core and sand blast sands, fire clay, fuel oil, etc.

Milwaukee Printing Co., 377 Florida Street, manufacturer of cartons, food and candy wrappers and advertising material, is starting work on a six-story addition, 86 x 132 ft., to cost $200,000 with equipment, motors, etc. A complete lithographing plant is being added. Architects are Tharinger & Bruecker, 774 Third Street, local.

Village of Randolph, Wis., has approved proposed expenditure of $58,000 for rebuilding and enlarging municipal electric light and power plant. New boilers, two new generators and an addition are contemplated. L. E. Williams is city clerk.

Parker Pen Co., Janesville, Wis., manufacturer of fountain pens and pencils, is starting construction work on a two-story addition costing about $35,000.

Allen-Bradley Co., 494 Reed Street, manufacturer of electric control devices, has let general contract to Henry Danischefsky, 1484 Humboldt Avenne, local, for erecting a furnace house and substation, 44 x 140 ft., one and two stories.

Hartland Engine & Machine Co., Hartland, Wis., has been organized with $50,000 capital stock to operate a machine shop and build and repair internal combustion engines. Principals are Alfred Hilton, Grove E. Palmer and J. H. Overbough. Details of company's plans have not been completed.

Pacific Coast

SAN FRANCISCO, April 4.

CONTRACT has been let by Emsco Press Forge Co., 5701 South Boyle Avenue, Vernon, Los Angeles, to Union Iron Works, local, for a one-story plant unit to cost about $20,000 with equipment.

Douglas Co., 2435 Wilshire Boulevard, Los Angeles, manufacturer of airplanes and parts, has plans for a one and two-story plant at Santa Monica, 240 x 375 ft., to cost $90,000, with equipment. L. B. Norman, 1323 Georgia Avenue, Santa Monica, is architect.

Merritt Concrete Products Co., San Jose, Cal., manufacturer of concrete pipe, etc., will build a new plant at Oakland, Cal., to cost about $50,000 with equipment. H. A. Weigand is engineer.

Crawford & Daherty, 934 East Seventeenth Street, Portland, manufacturers of iron castings, have awarded general contract to Parker & Banfield, East Seventeenth Street, for a one-story foundry to cost close to $21,000 with equipment.

S. Karpen & Brothers, 925 West Irvington Avenue, Los Angeles, manufacturers of furniture, with headquarters at 626 West Twenty-second Street, Chicago, has filed plans for a four-story plant at Huntington Park, to cost $160,000 with equipment.

Ford Motor Co., Detroit, has taken title to a tract near Port Richmond, vicinity of San Francisco, and is said to be contemplating construction of one-story assembling plant, to cost in excess of $400,000 with equipment.

California Consumers Co., Los Angeles, recently organized to take over and operate Los Angeles Ice & Cold Storage Co.; Pasadena Ice Co., Pasadena, Cal., and other properties in southern California, has arranged for bond issue of $3,750,000, a portion of fund to be used for acquisition of companies noted, and for expansion and betterments. A. E. Fitkin & Co., Inc., 165 Broadway, New York, operating public utility properties, is identified with new organization.

Southwestern Gas & Fuel Co., Banning, Cal., recently acquired by Pacific Lighting Corporation, San Francisco, is planning extensions and improvements to cost about $50,000.

Gate Ice Co., Mesa, Ariz., is planning early erection of one-story ice-manufacturing plant, to cost about $55,000 with equipment.

Board of Education, Hillsboro, Ore., is considering installation of manual training equipment in new union high school to cost close to $200,000. Marion Stokes, Chamber of Commerce Building, Portland, is architect.

Ryan Aeronautical Corporation, 412 Union Building, San Diego, Cal., is arranging for manufacture in United States of Siemens-Halske radial air-cooled airplane engines, formerly made only in Germany, and sold in this country as Ryan-Siemens engines. Company contemplates erection of plant for initial production of 1000 engines annually.

Offices and warehouse of Lally Co., San Francisco, pipe distributer, have been moved from 1123 Harrison Street to 1261 Howard Street.

Union Machinery & Supply Co., Seattle, has opened a branch at Portland with temporary headquarters at 68½ Fourth Street under management of Fred W. Rodolf. It will act as distributer for Massillon shovels and other construction equipment.

City of Elma, Wash., will purchase a new steel tank of 500,000 gal. capacity for water supply and an auxiliary Diesel pumping engine.

Canada

TORONTO, April 9.

SLOWING up of machine-tool sales was noted the past week, but this was probably due more to the approaching Easter holidays than to users dropping out of the market. The automotive industry is not buying as extensively as it was a couple of months ago, but sales of single tools for garages and repair plants continue at a high level. Business closed during March, in all lines, was the best month so far this year.

Ingersoll Machine Co., Ingersoll, Ont., is building an addition and will shortly be ready for installation of equipment.

General Metal Devices, Ltd., Oakville, Ont., recently organized with capital stock of $200,000, is completing arrangements for erection of a manufacturing plant covering an area of 18,000 sq. ft. Thomas Strachan is president of company; Edward Bamber, vice-president; Edward Stansbury and Albert McMurray, members of board.

Otto Higel Co., Ltd., King and Bathurst Streets, Toronto, is planning to build a factory at St. Hyacinthe, Que., to cost about $100,000, for manufacture of pianos, gramophone, piano actions, mechanisms, etc.

Bids are being received by B. Swartz, architect, 336 Dundas Street West, Toronto, for erection of a factory, to cost $20,000, for Queen City Furniture Co., 51 Vine Street. It will be two stories, 30 x 90 ft., steel and brick construction.

Barnes Top & Trimming Co., 137 Adelaide Street West, Toronto, will build a one-story factory, construction to be started about May 1.

W. Hughes, 216 Simcoe Street, has general contract for erection of one-story addition, 60 x 70 ft., to plant of White & Thomas, sheet metal products manufacturer, 210 Simcoe Street, Toronto.

Toms Contracting Co., Ltd., 245 St. Clair Avenue East, Toronto, has been awarded contract for an addition to local plant under construction for Dominion Boxboards, Ltd., to be one story and basement, 65 x 139 ft. J. L. Carey, 208 North Laramie Avenue, Chicago, is engineer.

R. Truax Son & Co., Walkerton, Ont., manufacturers of sash and doors, etc., will start work immediately on erection of a new two-story factory, 80 x 80 ft.

Wells & Gray, Ltd., Confederation Life Building, Toronto, has contract for construction of a new plant for Reid & Brown Structural Steel & Iron Works, Ltd., 63 Esplanade East, Toronto.

Western Canada

Canadian Forest Products Co., Ltd., Victoria, B. C., and Chicago, is having plans prepared for erection of a hydroelectric power plant on Nimkish River, British Columbia, to provide power for a pulp and paper mill on which construction will be started later.

Terminal Sheet Metal Works, 1043 Pender Street West, Vancouver, B. C., has awarded contract to B. Davidson, 1012 Broughton Street, for erection of a one-story plant, 71 x 120 ft.

Foreign

CONSTRUCTION of a tin smelting plant is contemplated by N. V. Hollandsche Metallurgische Bedrivjen, Arnhem, Netherlands, recently organized to cost more than $1,000,000 with machinery.

Municipal Council, Moscow, Russia, has appointed a special commission to develop plans and purchase equipment for an automobile manufacturing plant for light cars. Initial works will have capacity of 10,000 cars per annum. A fund of $20,000,000 is being arranged for entire project. Majority of machinery will be purchased in United States.

Standard Oil Co., 26 Broadway, New York, plans rebuilding portion of its refinery, and storage and distributing works at Regla, Cuba, destroyed by fire April 5, with loss reported in excess of $350,000 including equipment.

Mexico Northern Power Co., LaBoquilla, State of Chihuahua, Mexico, has secured permission to build an addition to its local hydroelectric generating plant. Project will include construction of an irrigation system in this district, with electrically-operated pumping stations. A fund of $1,500,000 has been arranged for expansion.

Ulen & Co., Inc., 120 Broadway, New York, subsidiary of American International Corporation, same address, has a contract from Government of Persia for construction of a railroad from Caspian Sea to Persian Gulf. It is estimated to cost $80,000,000, with station structures, shops, rolling stock, etc., and will require about six years for completion. J. G. White Engineering Corporation, 43 Exchange Place, New York, will be associated with enterprise.

Motor-Columbus Corporation for Electrical Enterprises, Zurich, Switzerland, operating electric power properties, is organizing a subsidiary to be known as Swiss-American Electric Co., with headquarters at Zurich. New company is arranging for financing and will dispose of a security issue in United States. It will secure an interest in Italo-Argentine Electric Co., Buenos Aires, Argentina, as well as other South American light and power properties, including Bahia Blanca Electric Co., operating in Argentina, and Compania Americana de Luz. An expansion program will be carried out for power plant construction and new transmission lines. New company will have total assets approximating $26,000,000 in properties.

Department of Public Works, Angora, Turkey, has approved plans for a new hydroelectric power plant with capacity of 100,000 hp., output to be used for Government nitrogen works.

New Trade Publications

Gas vs. Acetylene for Cutting. — International Acetylene Association, 30 East Forty-second Street, New York. Pamphlet of 24 pages, containing two addresses on this subject before a recent association meeting, one giving results of a precise laboratory study, the other citing experience at several shops where both systems of cutting have been in use.

Electric Switches and Containers.—Allen-Bradley Co., Milwaukee. A number of bulletins and price sheets covering a variety of starting and stopping switches and other like equipment for electric power use. Information and illustrations are in considerable detail.

Fuel Feed for Gas Producers.—Wellman-Seaver-Morgan Co., Cleveland. Bulletin 90 describes and illustrates a new type of fuel feed for mechanical gas producers. Passing of the fuel from the overhead bin to the producer is controlled by two bells which are lowered and raised alternately.

Centrifugal Pumps.—Aldrich Pump Co., Allentown, Pa. Data bulletin 70 of 16 pages illustrates and describes in considerable detail single-stage, double-suction centrifugal pumps rated from 20 to 14,000 gal. a minute. Speeds vary from 690 to 1750 r.p.m. Tables of particulars give clearances and other items in the design.